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# Does the Tail Wag the Dog?

## An Appraisal of Foreign Trade in Relation to Business Recovery

By G. L. LACHER

THE free trade conception of world business as an exchange of goods between countries is in error. The exchange is between individuals of different countries. A nation may be wealthy, but if its buying power is concentrated in a small class its consumption of the world's goods will be small.

The United States towers far above other nations as a consumer of commodities because of high mass purchasing power. And that diffusion of buying power was not achieved under free trade. It was attained through protection of labor, through elevation of living standards, through wide distribution of wealth.

Continued exposure to low-price foreign competition, now accentuated by currency depreciation, will depress our living standards toward the lowest prevailing international levels. It will destroy the earning power of our factories and our wage earners. It will ruin a market which supports 74 per cent of the world's motor vehicles and consumes 61 per cent of the world's output of petroleum, 62 per cent of the rubber, 45 per cent of the steel, 48 per cent of the tin, 73 per cent of the silk and 27 per cent of the coffee. It will sharply lower world consumption, and not raise it, as tariff revisionists claim.

Even from the standpoint of European industrial nations, any temporary advantage they may gain by entry to our markets will be far outweighed by the loss to the world of our raw material imports. It is a gross distortion to say that the United States must export to live. Other nations need our trade much worse than we need theirs.

A GROUP of men chained together were walking briskly along the road of world trade. At the head of the line was a figure that towered far above the others. This leader was Uncle Sam. Intoxicated by "new era" spirits, he was whistling merrily and not watching his step too carefully. As he reached the top of a hill, he failed to notice a turn in the road and plunged over a precipice. Behind him hurtled his companions. They all landed helter-skelter in a morass of depression with their chains badly tangled one with the other. They wallowed. They struggled. Finally several slipped from the boggy ground into the open water of currency depreciation. This increased the strain on those who were still in the bogs. In fact, for a time it looked as if Uncle Sam would be pulled into the pool with them. They shouted to him that they couldn't get out unless he relieved them of their debt packs. But he replied that if all their packs were heaped on him he would sink even more hopelessly into the bog of depression. It did not occur to him that if he released himself from his chains he could gain firm ground and pull his unfortunate companions, packs and all, to safety. Having been in harness so long, he was not aware that he could make a single move without the help of his fellows. He underestimated his enormous individual strength, which was equal to that of many of his companions combined.

### What the Internationalists Urge

This, I fear, is an accurate picture of Uncle Sam today. Although this country is more nearly self-sufficing than any other nation on the globe, we are constantly reminded by leaders here and abroad that our recovery cannot come until the world as a whole gets on its feet. And world recuperation, it is stated, is impossible without the removal of trade barriers or the cancellation of war debts or both. Europe tells us, "We can neither pay our debts nor buy your goods unless you buy from us." And then it turns to our bankers and whispers, "Your private loans to us won't be worth much unless our debts to your Government are wiped out and American tariffs are reduced."

So our own bankers have joined foreign nations in a plea for debt cancellation and tariff revision.

The views of foreign statesmen are necessarily ex parte and must be discounted. But the opinions of our international bankers should count for something. As recent testimony in Washington disclosed, they were so well posted during the stock market boom that they completely misjudged the trend of events.

Possibly we should depend on our own counsel rather than theirs at the

present juncture. A study of international trade relations in the years following the war discloses that the United States, although new as a creditor nation, played that rôle according to the time-honored standards. It exported capital lavishly. Its foreign loans and investments grew by leaps and bounds. Its invisible imports through the medium of tourist expenditures, immigrant remittances and the like were also very large. And in this way the United States succeeded in consistently exporting more merchandise than it imported.

The outward flow of American funds was checked in 1929, when the high interest rates on stock market call loans not only absorbed liquid domestic capital but foreign capital as well. The artificial scarcity of capital, thus created, soon had its effects on business and prices in raw material countries. Their buying power shrunk and then the industrial nations suffered.

There was a temporary recovery of the flow of capital out of the United States in 1930, but it did not repair the havoc that had been wrought. The feeling of insecurity that the stock market panic had created, together with operations incident to the stabilization of the franc, was reflected in heavy withdrawals of French short-term loans from foreign money centers. Withdrawals by other countries followed and as the position of debtor nations grew worse they lost considerable of their own domestic capital, which sought refuge elsewhere, either because of fear of currency depreciation or to escape impending increases in taxation.

In the latter part of 1930 increasing political tension in Europe and other factors caused a rise of hoarding in France. The French banks, in order to replenish their cash reserves, were forced to draw on their foreign assets. Finally, with the failure of the largest Austrian commercial bank, the Credit-Anstalt, in May, 1931, the position of the debtor countries of Central Europe became so critical that President Hoover proposed a one-year moratorium of war debt and reparation payments. Adoption of President Hoover's proposal, however, did not prevent the withdrawal of short-term loans from Germany. This movement assumed such dangerous proportions that the creditors had to consent to what amounted to a private moratorium under the so-called Standstill Agreement.

One of Germany's principal short-term creditors was Great Britain. Confidence in Britain's financial position was weakened and a run on sterling set in which drove the pound off the gold standard. A run on the dollar followed but failed to produce the same result.

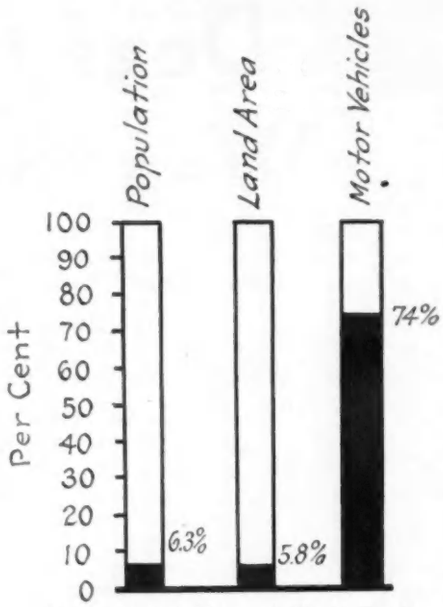
As a consequence of this chain of events the movement of capital from creditor to debtor countries has practically ceased. Capital has sought havens of supposed safety and hence there is a concentration of the world's gold in a handful of countries. Other nations have either depreciated their currency or have introduced rigid restrictions on imports and exchange to protect their remaining gold reserves. These measures have naturally crippled trade. Moreover, currency depreciation in those countries which left the gold standard has failed to increase their domestic prices and has caused international gold prices to decline.

Depreciated currency countries can raise their exchange only by exporting more than they import. But they are apparently in no haste to lift their exchange. Through her present competitive advantages Great Britain has recovered her former leadership in world trade. At the same time she must be aware that prices in gold standard countries, and particularly in the United States, have been driven to such ruinously low levels that her bargaining position in war debt negotiations has been greatly strengthened.

Let us assume, for the sake of argument, that Britain gains her point and that her war indebtedness to us is largely wiped off the slate. Would world recovery ensue? The one-year moratorium did not turn the

(*Continued on Advertising Page* 14)

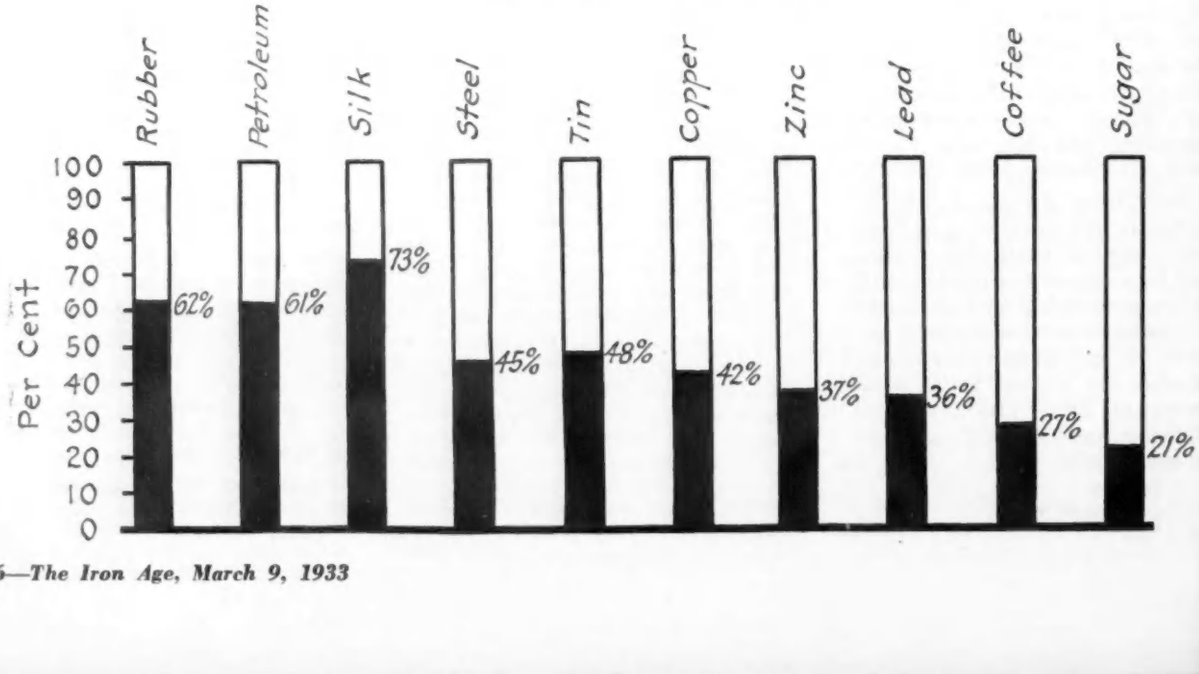
## The United States Is Far in the Lead as a Consumer of the World's Materials




*United States' Share of World Total*

**THE world, no less than the United States, will lose if our industries are deprived of adequate protection. The world may gain a larger market for its manufactures in this country, but it will lose a far more valuable market for its raw materials. American farmers may expand their exports, but they will lose much more in reduced sales to their best customer, domestic industry.**

*United States' Consumption of World Output*



*Welding Battledeck floors of the A. O. Smith Building, Milwaukee*

# Discusses Objections to Use of Welded Steel Floors

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***A PAPER written to prove that welded steel floors are both practical and economical was one of the winning contributions to the second arc welding prize contest conducted by the Lincoln Electric Co., Cleveland. The author was Colin O'Neal Skinner, American Institute of Steel Construction, New York.***

***Inasmuch as extensive use of such floors will greatly increase the demand for steel plate and for welding equipment, the status of acceptance of this development in the construction industry should be of active interest to the material and equipment industries. Something of this status is reflected from Mr. Skinner's discussion of objections quoted in part below. The complete paper, which covers also design and advantages, will be published, with other leading papers of the prize competition, in book form by the Lincoln company.***

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IF the two major premises, namely that welded steel floors are practical and economical, are true, and if the possibilities outlined in the paper were more fully developed, the gross amount of welding probably would be several times as great as it is today.

The main purpose of this paper is to present the possibility of making floors entirely of steel. In the case of bridges, garages, warehouses, factories and many other structures, these floors may be left bare both top and bottom. An automatic sprinkler system may be installed under such floor. In residences, office buildings, etc., practically any of the commonly used floor coverings may be applied on top of the steel plates, and the ceiling covered with metal lath and plaster, or with precast blocks of gypsum or other fireproofing. The art of welding has developed to a point where steel floors are now practical.

About two years ago the American Institute of Steel Construction, Inc., started a campaign to increase the use of steel plate floors. The term "battledeck floor" was adopted and applied to floors made by welding flat steel plates to steel beams, so that the plates and beams act together in resisting stresses. The composite T-beams so formed are stronger and much stiffer than the original beam alone. In a typical case, with 5-in. I-beams spaced 2 ft. 0 in. c.c., a ¼-in. plate welded to the beams increases the section modulus of each beam 23 per cent and increases the moment of inertia 110 per cent. Tables were published showing the properties of the T-beam that resulted from welding 3/16 and ¼-in. plate to beams spaced 24 in. c.c.

Since then a number of battledeck floors have been built in various localities. Most of these have been comparatively small installations of a more or less experimental nature. Although the construction of steel plate floors is not strictly new in bridge work, use of steel floors for buildings is still a new and undeveloped field.

It is probably true that a great majority of architects and engineers have never seriously considered the possibilities that exist in this field, especially in view of the recent developments in welding. Some of the objections most commonly heard against the use of steel floors are:

**1.—Steel floors are new to most architects and engineers.**

**2.—They may be noisy.**

**3.—Many people fear that expansion and contraction with changes in temperature may lead to serious results.**

**4.—Amount of fireproofing necessary is unknown.**

**5.—Floor coverings may be difficult to attach.**

**6.—Pipes, electrical conduits, etc., may be difficult to install.**

**7.—Many people still consider welding unreliable.**

**8.—The cost is high, due mainly to lack of experience in construction and erection.**

Each of these objections is discussed below in the order given.

*1.*—The fact that steel floors are new is probably the greatest single objection at present. Many architects and engineers have seen the literature on battledeck floors and recognized the possibilities that exist, but still have not the courage to give steel floors a trial. The men who have the responsibility of making these decisions would rather not be the first to try the new.

This attitude is n a t u r a l and is easily understood. All new construction methods must go through a similar period of development before being accepted as good practice. Another vital factor is that the proper method for designing welded steel floors is not fully understood, and none of the available engineering books contain data on this subject. Design theories must be developed and checked by actual tests. Then curves and tables computed to aid in the design. Careful study has been made of the actual loads that occur in buildings and also on bridge floors and curves have been developed showing the proper thickness for a steel plate floor for various spans and with a uniform live load or with a concentrated load, such as from a truck wheel. The art of welding is making excellent progress, and the increasing success of welding is one of the principal factors that make steel floors practical.

**Any type of standard floor finish—including wood parquet—may be used on top of steel floors, and any of the customary ceilings used below, if necessary for appearance or for fireproofing**

### Battledeck Floors Quiet

*2.*—Steel floors are made of comparatively few pieces and these are welded together to form a strong, rigid unit. A battledeck floor covered with a thin layer of mastic cement and a material like linoleum or cork tile is surprisingly quiet because the steel plates and the floor covering are of different densities and quickly damp out vibrations in each other. The floor beams, which are very close together and are welded to the plate, also stiffen the plate and prevent vibrations that are essential to sound transmission.

Thousands of steel ships have been built with plate usually ¼ to ⅜ in. thick, riveted to beams spaced about 30 in. c.c. These floors usually have no ceiling and are covered above with a thin layer of material such as a mixture of sand, asphalt and cement. Rough tests indicate that these floors are very quiet for all ordinary sounds that occur in residential and office buildings. Standard methods of ship construction show that steel floors, when covered with a mastic compound and a floor covering like linoleum are surprisingly quiet, and this will be one of the outstanding advantages of steel floors.

### No Danger from Expansion and Contraction

*3.*—Fear that expansion and contraction due to ordinary temperature changes will be dangerous is not warranted, and can be easily dispelled. Steel and concrete have nearly the same coefficient of expansion. This is one of the facts that has permitted the great developments that have taken place in reinforced concrete construction. These two materials have many fundamental properties that are different, yet they may be used together because they expand and contract at practically the same rate. Reinforced concrete floors supported on steel beams are recognized universally as first class construction. In most cases the results of temperature changes are so small that they can be safely ignored. In the few cases where temperature changes are important, they are easily provided for in either concrete or steel floors.

### Ample Fire Protection Possible

*4.*—The amount of fireproofing necessary on a steel plate floor is still debatable. The fireproofing should be capable of insulating the steel so that the temperature will not rise above a certain point at any time during the fire. It should also be sufficient to confine the fire to the room in which it originates, and so prevent its spread.

With modern fireproof construction there is very little combustible material in any one room, and a fire soon burns itself out without generating much heat. Experts have estimated that an ordinary plaster ceiling 1 in. thick, on metal lath, will give satisfactory fire protection for about one hour. A gypsum ceiling 1½ in. thick will protect the steel for about 4 hr. Several manufacturers have devised methods for attaching precast ceiling slabs. Very little fireproofing is required on top of a steel floor because heat rises and the air which is necessary to support combustion is relatively cool and is drawn in along the floor. A fire built on top of steel plate will not heat the plate nearly as much as one built under the plate. There are a number of materials which, when applied about ½ in. thick directly on top of a steel floor, will give ample fire protection and will also greatly reduce sound transmission.

### Problem of Floor Coverings Solved

*5.*—The problem of floor coverings s e e m s difficult at first. A l i t t l e study, however, shows that practically every difficulty that may arise has already been solved. Any standard floor covering may be applied. Several large companies have already studied this problem and have devised economical methods for applying various finishes to steel floors. Linoleum may be laid on a felt base that is cemented to the steel. Any of the commonly used floor tiles may be easily applied. For rooms carpeted all over, a material like Celotex or felt may be cemented to the steel and the carpet applied directly. For wood floors a tacky mastic may be applied about ⅛ in. thick and the wood laid directly on this mastic. All modern ships such as the Europa, Leviathan and the Bremen have steel plate floors with floor coverings equal to those found in the best hotels.

### Pipes and Conduits Not Difficult to Install

*6.*—In modern fireproof floors made of steel and concrete it is customary to lay all small pipes and electrical conduits on top of the rough structural slab and then encase these conduits with a layer of cinder concrete

(*Concluded on Advertising Page* 12)

# What the Machine Has Done to Us

## The Cost of Living and the Real Wage

By WALTER S. GIELE

WE have seen how completely the system of prices pervades the fabric of our lives. We have been considering the wholesale commodity price level, which is the phase of the price system involved in the conduct of industrial and commercial enterprises. It is the phase of the price system that determines the cost of the materials purchased by industries and determines the gross income derived from the sale of their products. It determines the cost of the goods bought by all classes of distributing agencies and the proceeds from the sale of those goods received by all except the retailer who sells to the ultimate consumer.

As we come now to a consideration of the real wage we must investigate its controlling factor—the cost of living. The family as a unit is concerned with the prices of goods, services and rights at retail.

Just as an index number of wholesale prices must be constructed with reference to the relative importance of its components by weighting the items that go into it so a cost of living index number must be constructed with regard to the relative quantities in which the various goods and services involved are required by the family.

The relative distribution of budget items will vary with the social status and with the economic status of the family. At one end of the scale will be the family whose income is hardly adequate for the barest necessities of food, clothing and shelter. As economic pressure becomes less severe a constantly decreasing proportion of total expenditures will go for these bare necessities. More expensive kinds of goods may be bought and quantities will be more liberal. Especially in the items of clothing and shelter will the style factor have greater weight. The rising budget will admit a greater number and variety of items. Expenditures for health and recreation, for education and for culture, impossible to some are necessities to others.

Regardless of social or economic status the family budget will vary with geographical location and environment. The provision of winter clothing and of heating, for instance, will be essential in a northern climate and unnecessary in a southern. Transportation to and from work may be an appreciable item in the metropolitan centers and not enter at all in a rural environment.

The changing habits of life with the passage of time also have a profound effect on the distribution of the family budget. Many of the "necessities" of this generation were not even known only two or three generations ago. Our present study extends back to 1849. The relatively few who could afford servants probably lived comfortably enough in those earlier days. But consider the drudgery to which the vast majority of the population was consigned. Think of the infinite labor of pumping and carrying water, of sawing and splitting firewood and the never ending tasks of the housewife who made the candles and the soap and the bread and the clothes, and canned food besides raising the babies and making herself generally useful around the house.

Today we scarcely give thought to such commonplaces as gas ranges, bath rooms, electric lights, packaged foods and what not.

The changing age distribution of the population, as well, has an important bearing on the family budget. The reduction in the number of dependents per person gainfully occupied has made the burden much lighter than it once was—heavy as it may seem in these days of depression.

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**IN this, the fifth instalment of Mr. Giele's factual study of mechanization and its effects, the author discusses the cost of living and the real wage. Charts are presented which show the remarkable equilibrium between wages in the manufacturing industries and cost of living over a 30-year period ending in 1920, and the abrupt elevation of the manufacturing wage level which took place at that time. Commenting upon this, the author says: "A relative rise in the wage level of the workers in one industrial group makes it difficult for the workers in all other groups to buy the product of the industry so affected. The logical consequences are first, reduced volume of sales of such products, and, second, reduced employment in the industries making those products."**

Careful and exhaustive studies have been made by many competent investigators on the typical family budget and the cost of living. The attempt to adjust the money wage to the rapidly rising budget of the war period gave a great impetus to these studies. The United States Bureau of Labor Statistics has computed a series of cost of living index numbers beginning with 1913, based on carefully gathered and analyzed data. The National Industrial Conference Board, Inc., has made extensive and careful investigation of the cost of living and publishes a monthly figure. Paul H. Douglas has made an exhaustive study published in his book "Real Wages in the United States, 1890 to 1926" (Houghton, Mifflin & Co.)

Difficult as it appears to be to arrive at an average index number which will truly represent the vast variety of family budgets, it is believed that the index numbers which have been developed are sufficiently representative on a comparative basis and that they adequately serve to evaluate the rate and extent of change in the real wage; which is their primary purpose.

For the purpose of the present study we have adopted the series of the Bureau of Labor Statistics beginning with 1913, converting the original figures to the base 1926 = 100. While Paul Douglas points out certain differences between his series and that of the Bureau of Labor Statistics which are important for his purpose, those differences do not appear to be of sufficient magnitude to materially affect the broader, underlying trend we are here seeking to discover. We have therefore converted the Douglas series to a base which will equalize with the Bureau of Labor Statistics figure for 1913 and used the figures so obtained for the period 1890 to 1913.

### Relation of the Cost of Living to Wholesale Prices

The cost of living curve beginning 1890 and including 1932 is compared with the wholesale commodity price curve in Chart 16. While fundamentally both index numbers are aggregates of prices and subject to the same kinds of influences they are subject to different conditions. In general they move in unison, their courses being substantially parallel in periods of relative stability.

In periods of rapid change, however, the rate and extent of change is

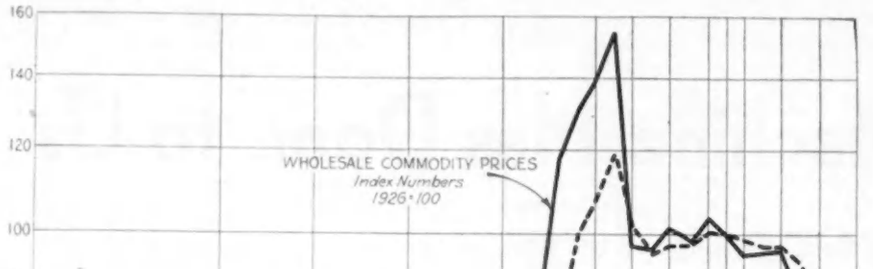



Chart 16—Comparison of Wholesale Prices With Cost of Living

greater for the wholesale price curve than for the cost of living curve. This is quite logically so. The buyers of goods at wholesale are the industries which buy raw materials for manufacture or the distributers who buy goods for resale. The manufacturer must buy materials in advance of his needs in order to continue manufacturing. The distributer must buy goods in advance in order to have them available when called for. Neither type of buyer offers determined resistance on a rising market because he expects to recoup when he comes to sell. In any event he must buy to remain in business. On the other hand, the retail buyer is disposed to resist any advance over prices he has been accustomed to pay. Unlike the manufacturer and the distributer, he can postpone many of his purchases as he may choose.

Thus in a period of rapidly rising commodity prices such as began in 1915 we find the cost of living rising simultaneously with wholesale commodity prices. The cost of living is conditioned by the necessity for the retail purchases of goods of immediate consumption like foods and fuel, but it does not rise so fast nor so high as the wholesale price because it is conditioned also by the postponement of the purchase of such articles as clothing. On the other hand, in periods of rapidly declining wholesale commodity prices we find cost of living declining more slowly. In the period 1920 to 1921 and again 1929 to 1932 the cost of living fell roughly only half as fast and half as far as wholesale commodity prices. Here, again, the buyer at wholesale has on hand materials for future use and delivery while the buyer at retail has bought only for immediate need. Moreover the seller must sell while the retail buyer may still postpone many of his purchases in anticipation of even lower prices. The seller of automobiles can hardly sell last year's model at any price, but the retail buyer, that is the user, of an automobile can choose to continue driving last year's model for two more or five more years if he wants to. There are, of course, other factors influ-

**TABLE FOR CHARTS 16, 17 and 18**

**The Cost of Living beginning with 1890 and including 1932 (Index Numbers)**

**Wholesale Commodity Prices (Index Numbers)**

**Money Wage (Dollars) and Real Wage (Index Numbers)**

**1926 equals 100 for Index Number Series**

| Year | Cost of Living | Wholesale Price Index | Money Wage | Real Wage |
|---|---|---|---|---|
| 1889 | ... | 57.4 | $445 | ... |
| 1890 | 43.3 | 56.2 | 443 | 79.3 |
| 1891 | 42.1 | 55.8 | 441 | 81.2 |
| 1892 | 42.5 | 52.2 | 439 | 80.1 |
| 1893 | 41.7 | 53.4 | 437 | 81.2 |
| 1894 | 40.4 | 47.9 | 435 | 83.5 |
| 1895 | 40.4 | 48.8 | 433 | 83.1 |
| 1896 | 41.3 | 46.5 | 431 | 80.9 |
| 1897 | 41.7 | 46.6 | 429 | 79.8 |
| 1898 | 41.7 | 48.5 | 427 | 79.4 |
| 1899 | 42.5 | 52.2 | 425 | 77.5 |
| 1900 | 44.2 | 56.1 | 436 | 76.4 |
| 1901 | 45.0 | 55.3 | 446 | 76.8 |
| 1902 | 46.2 | 58.9 | 457 | 76.7 |
| 1903 | 48.3 | 59.6 | 467 | 75.0 |
| 1904 | 47.9 | 59.7 | 478 | 77.4 |
| 1905 | 47.9 | 60.1 | 486 | 78.7 |
| 1906 | 49.6 | 61.8 | 494 | 77.2 |
| 1907 | 52.5 | 65.2 | 502 | 74.1 |
| 1908 | 50.4 | 62.9 | 510 | 78.4 |
| 1909 | 50.4 | 67.6 | 518 | 79.7 |
| 1910 | 53.4 | 70.4 | 532 | 77.2 |
| 1911 | 55.0 | 64.9 | 547 | 77.1 |
| 1912 | 55.4 | 69.1 | 561 | 78.5 |
| 1913 | 57.1 | 69.8 | 576 | 78.2 |
| 1914 | 58.8 | 68.1 | 590 | 77.8 |
| 1915 | 60.0 | 69.5 | 705 | 91.1 |
| 1916 | 67.6 | 85.5 | 819 | 94.0 |
| 1917 | 81.3 | 117.5 | 934 | 89.2 |
| 1918 | 99.5 | 131.3 | 1,048 | 81.7 |
| 1919 | 107.5 | 138.6 | 1,163 | 83.9 |
| 1920 | 119.0 | 154.4 | 1,172 | 76.3 |
| 1921 | 101.2 | 97.6 | 1,180 | 90.3 |
| 1922 | 95.9 | 96.7 | 1,218 | 98.4 |
| 1923 | 97.6 | 100.6 | 1,255 | 99.6 |
| 1924 | 97.4 | 98.1 | 1,268 | 100.9 |
| 1925 | 100.3 | 103.5 | 1,280 | 98.9 |
| 1926 | 100.0 | 100.0 | 1,290 | 100.0 |
| 1927 | 98.6 | 95.4 | 1,300 | 102.2 |
| 1928 | 97.4 | 97.7 | 1,312 | 104.5 |
| 1929 | 97.5 | 96.5 | 1,323 | 105.2 |
| 1930 | 93.4 | 86.3 | 1,217 | 101.0 |
| 1931 | 84.6 | 73.0 | 1,110 | 101.7 |
| 1932 | 76.4 | 64.8 | ... | ... |

Sources—Cost of Living, 1890-1913, Paul Douglas original figures converted to match U. S. Bureau Labor Statistics series at 1913; 1913-1931 Bureau Labor Statistics. Wholesale Price Index, Bureau Labor Statistics; Money Wage Bureau of the Census. Money Wage for intercensal years computed by distributing change between censal years.

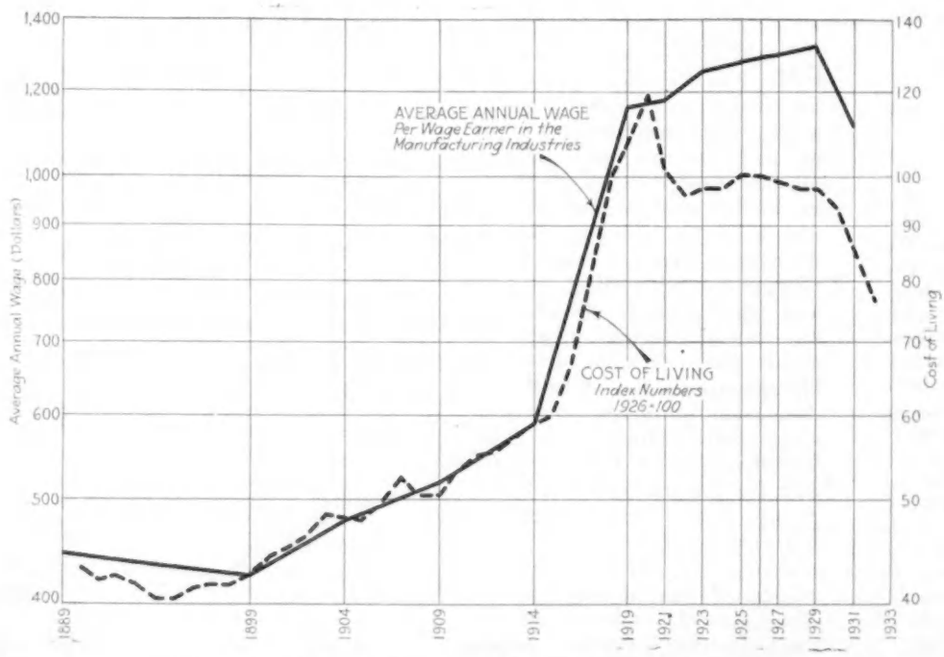



Chart 17—Relation of Average Annual Money Wages to Cost of Living

TABLE FOR CHART 19

Real Wage computed by dividing money wage by wholesale commodity price index

| Index Numbers 1926 Equals 100 | | Index Numbers 1926 Equals 100 | |
|---|---|---|---|
| 1849 | 32.0 | 1919 | 65.0 |
| 1859 | 36.7 | 1921 | 93.8 |
| 1869 | 24.9 | 1923 | 96.6 |
| 1879 | 45.7 | 1925 | 95.8 |
| 1889 | 60.1 | 1926 | 100.0 |
| 1899 | 63.1 | 1927 | 105.7 |
| 1904 | 62.1 | 1929 | 106.3 |
| 1909 | 59.4 | 1931 | 117.8 |
| 1914 | 67.1 | | |

Source—Computed from data of charts 18 and 19.

encing the relation between the cost of living and wholesale prices, but enough has perhaps been said to illustrate the logical basis on which these relations rest.

### Relation of Cost of Living to Wages

Chart 17, in which are compared average annual money wages in the manufacturing industries with the cost of living, tells a story astounding indeed. Through all the vicissitudes of the thirty years from 1890 to 1920 the money wage followed almost exactly the cost of living. With the commodity price deflation beginning in the latter year and its consequent reduction in cost of living there was no corresponding wage reduction. On the contrary there was a progressive increase in money wages to 1929. Even the reduction in average annual wage showing in 1931 compared with 1929 reflects part time employment more probably than wage rate reductions.

Computing this relation as an index of real wages, shown in Chart 18, we find that real wages changed but little from 1890 to 1920 with the exception of the period of the World War, during which time real wages were temporarily but substantially increased. The abnormal demand for factory workers coupled with the reduction in supply due to military service and cessation of immigration operated to raise money wages faster than cost of living in that disturbed period. Since 1920 real wages have found a new and higher level.

To say that wages are too high in the manufacturing industries would undoubtedly invite controversy. The record, however, admits no controversy. The record says that average annual money wage in the manufacturing industries followed almost precisely the cost of living for the thirty years from 1890 to 1920. The record further says that these same average annual money wages not only suffered no post-war deflation as did commodity prices, but, in fact, continued to rise from 1920 to and including 1929.

Translated into the terms of purchasing power this record means that the average real wages of the wage earners in the manufacturing industries were maintained in reasonably stable equilibrium with the average real wages of the wage earners in all other occupational groups at a level represented by an index number rather below 80 (1926=100) for thirty years from 1890 to 1920 except for a temporary dislocation during the war years.

With the commodity price readjustment of 1921 the average real wage of the wage earners in the manufacturing industries was bodily lifted to a level represented by an index number rather above 100 (1926 = 100) and was still above that plane in 1931, the latest year for which data are available at this writing. This offset in the trend of real wages in manufacturing corresponds to and coincides with the offset in the trend of money wages, to which reference has been made in a previous article.

If manufacturing wages are not too high they clearly are at least twenty-five per cent higher (with relation to prices which depend in large degree on wages in other occupational groups) than the level at which equilibrium was maintained for at least thirty years. Those thirty years included such profoundly disturbing factors as the major depression of the 1890's and the World War period. A relative rise in the wage level of the workers in one industrial group makes it difficult for the workers in all other groups to buy the product of the industry so affected. The logical consequences are first reduced volume of sales of such products and second, reduced employment in the industries making those products.

### The Longer Trend in the Relation of the Cost of Living to Wages

So much for the period of the more recent past, for which we have comparable data and which lies within the memory of many of us.

It is desirable to explore as far as may be the longer trend and to discover if possible at least the general direction of that trend in its broader outlines. We have already observed how the index of wholesale commodity prices has moved in unison with the index of the cost of living for the past forty years, subject only to a greater amplitude in periods of rapid change.

Chart 19 has been prepared from a computation of a real wage index based on a division of money wages by the wholesale commodity price index instead of the cost of living index. The real wage based on the cost of living since 1890 is shown on the same chart for comparison. It would appear that for the past forty years the real wage computed on the wholesale

(*Concluded on Advertising Page* 12)

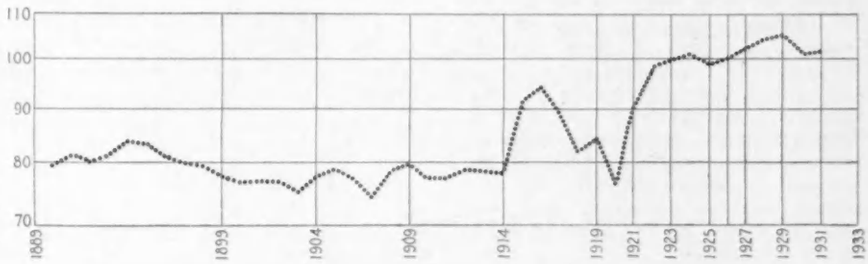



Chart 18—Index of Real Wages Computed on Cost of Living

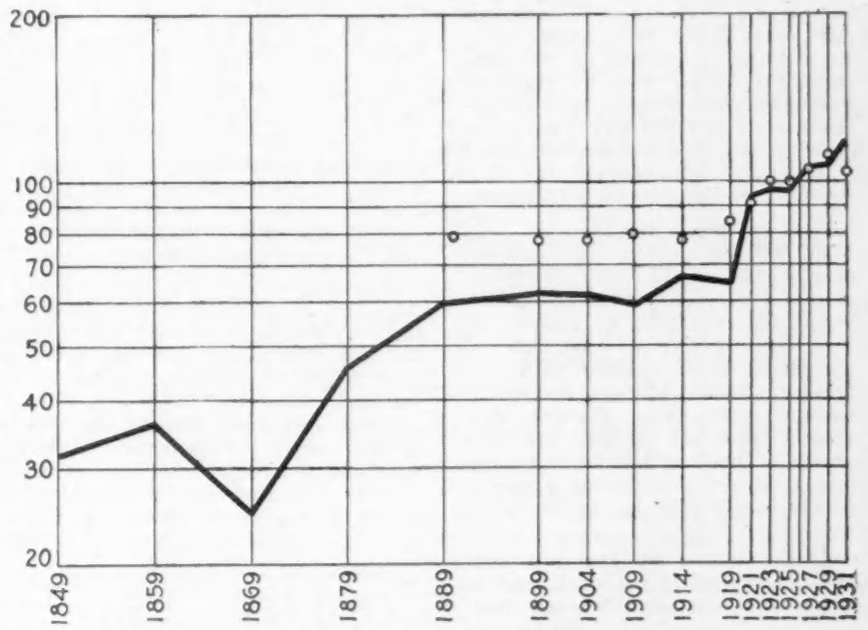



Chart 19—Index of Real Wages Computed on Wholesale Commodity Prices

# Adding Chromium to Cast Iron

FOR years chromium has been added to cast iron to give it special characteristics. Methods of alloying used in this country have been limited, until the last few years, to ladle additions or the use of chrome-bearing pig iron in the charge. As both of these methods have definite limits, and are not suitable where high percentages of chromium are demanded for heat or abrasion resistance, tests were conducted with chrome briquets added to the charge, to determine first the efficiency of the recovery, and second the effects on the physical properties of the iron.

(This article does not attempt to cover all the effects of chromium in cast iron. However, the instances cited were taken from actual practice. It is to be remembered that chromium affects different types of iron in different degrees, and that the intensity of this effect is largely governed by the carbon-silicon ratio.)

### Recovery of Chromium from Briquets

Each charge weighed 500 kg. (1102 lb.) and each briquet contained exactly 2.6 kg. (5.7 lb.) of ferrochrome (70 per cent Cr), so that one briquet introduced 1.8 kg. (4.0 lb.) of pure chromium or 0.36 per cent of the weight of the charge. Using the regular routine mixture for heavy machine parts, nine charges were alloyed with one briquet in each charge. The iron was to be poured into a large turbine casing weighing approximately 4500 kg. (about 5 net tons).

At the time of the first tap there were 11 charges in the stack, nine of which were alloyed. The individual taps were large and samples for analysis were collected from the iron at the spout of the beginning, middle and end of the tap. The numbering and analysis of the samples follow:

| Tap No. | Approximate Weight | Sample No. |
|---|---|---|
| 1 | 2000 kg. (4410 lb.) | 1–3 |
| 2 | 2500 kg. (5512 lb.) | 4–6 |
| 3 | 800 kg. (1764 lb.) | 7 |
| 4 | 800 kg. (1764 lb.) | 8 |

| Sample No. | TC | Si | Mn | P | S | Cr |
|---|---|---|---|---|---|---|
| | Per Cent | | | | | |
| 1 | 3.34 | 1.44 | 0.90 | 0.35 | 0.125 | 0.34 |
| 2 | 3.52 | 1.44 | 0.92 | 0.33 | 0.121 | 0.36 |
| 3 | 3.43 | 1.41 | 0.98 | 0.31 | 0.112 | 0.27 |
| 4 | 3.43 | 1.32 | 0.90 | 0.34 | 0.117 | 0.38 |
| 5 | 3.43 | 1.40 | 0.90 | 0.35 | 0.116 | 0.37 |
| 6 | 3.40 | 1.44 | 0.99 | 0.33 | 0.121 | 0.29 |
| 7 | 3.43 | 1.44 | 1.09 | 0.27 | 0.105 | 0.09 |
| 8 | 3.34 | 1.38 | 0.99 | 0.30 | 0.109 | 0.10 |

The foregoing tables indicate definitely that of the 0.36 per cent chromium included in each charge, an average of 0.33 per cent was recovered and also that the third and fourth taps to which no chromium was added absorbed the last traces. Such recoveries are well within the ordinary chemical requirements and considered satisfactory. The small amount of chromium carried by the charges subsequent to those intentionally alloyed will not adversely affect the properties of those castings.

In order to stay within the low melting losses on chromium shown above, the alloy has to be added in form of briquets. The same procedure should be followed as mentioned in L. H. Ransom's paper on "The Use of Silicon and Manganese Briquets in the Cupola" before the convention of the American Foundrymen's Association in 1932. The chromium briquets are placed directly on top of the coke between charges with the idea of protecting the chromium from oxidation by a gas containing none, or only a little free oxygen, on account of being a product of combustion of the coke.

The writer has found it advantageous to place the chromium briquets in the center of the cupola on account of the gases having increased oxygen content on the circumference of the cupola area, or close to the lining. Besides the advantageous effect of chromium additions to various properties of cast iron, there will be a considerable market on refractory material for purposes where machinability can be disregarded and where chromium alloy cast iron can compete with high-chromium alloy steel. In this case, the advantage of adding the alloy in briquet form, thus having the alloy protected from oxidation by a cement binder, is even more marked than in the case where only small percentages of alloys are required.

### Physical Properties

Since many investigators have published results on the effect of chromium on the physical properties of cast irons, it was deemed unnecessary to quote the results the writer has obtained from several concerns. Most of the investigators, however, have dealt with commercial types of cast iron, and have found maximum physical properties with chromium from 0.5 to 1 per cent.

After observation of a large amount of data, the author came to the conclusion that the optimum amount of chromium would increase with irons whose composition and thermal history would indicate a tendency toward graphitization. Conversely an

Fig. 1 — Structure of cast iron containing 0.21 per cent chromium. Reduced one-half from 400 diameters.

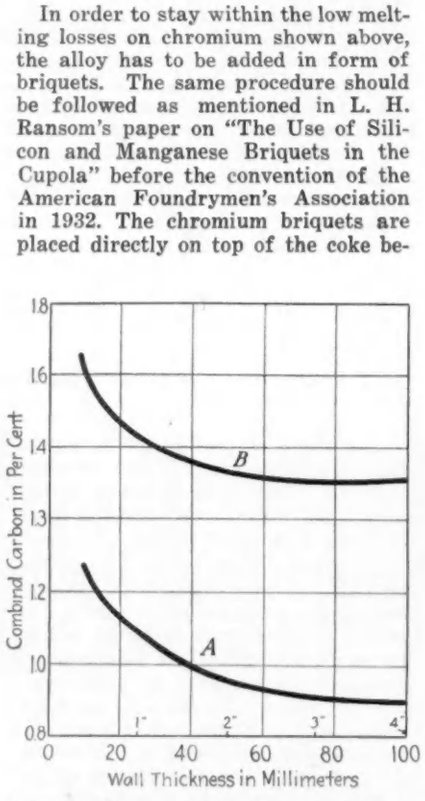



Fig. 3—Influence of chromium on combined carbon and wall thickness of gray iron. Curve A: 2.6% T.C; 2.13% Si, and 0.32% Cr. Curve B: 2.4% T.C; 2.12% Si, and 0.60% Cr.

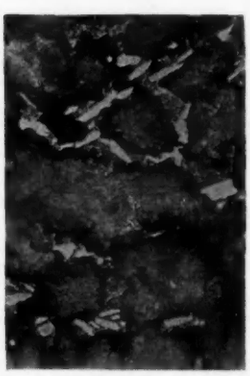


Fig. 2 — Structure of cast iron containing 0.67 per cent chromium. Reduced one-half from 400 diameters.

# ast on and Its Effects

By F. W. MEYER
FOUNDRY CONSULTANT
ROCKFORD, ILL.

**THE addition of chromium to cast iron in larger amounts than is possible through ladle additions or the use of chrome-bearing pig iron in the charge produces effects not hitherto made public. The chromium is added in the form of briquets with a high percentage of recovery, according to the author. It was found that the optimum amount of chromium increases with irons whose composition and thermal history indicate a tendency toward graphitization. The studies also disclosed that chromium exerts no influence on the sensitiveness of wall thickness, that it increases wear resistance and heat resistance. Experiments with grate bars confirmed the fact that chromium retards the growth that ordinarily accompanies exposure of regular cast iron to heat.**

iron whose composition tends toward the formation of carbides would attain maximum physical properties with less chromium.

In order to substantiate this theory the author determined the physical properties of an iron of a harder type, containing low carbon, low silicon, and high manganese, with small additions of chromium. In this case highest strengths came with 0.21 per cent chromium. Thus, it is essential that, in obtaining maximum physical properties, the graphite and carbide forming characteristics be considered, and the addition of chromium proportioned accordingly.

The structure with 0.21 per cent chromium is shown in photomicrograph, Fig. 1. With 0.67 chromium, the separation of carbides is more noticeable as shown by Fig. 2. These hard particles reduce the machinability of the iron, if present in sufficient quantities. Attention should also be called to the refining action of chromium on the pearlite, as illustrated in Fig. 2, compared with that in Fig. 1.

The base mixture, to which chromium was added, as shown in Figs. 1 and 2, had the following analysis in per cent:

| Total Carbon | GrC | CC | Si | Mn | P | S |
|---|---|---|---|---|---|---|
| 3.24 | 2.43 | 0.80 | 1.62 | 1.04 | 0.35 | 0.097 |

### Influence of Chromium on the Sensitiveness of Wall Thicknesses

It is a recognized fact that castings of decreased cross-section will contain an increased proportion of combined carbon, provided other conditions, such as mold temperature and iron composition, are held constant. This alteration in the chemical composition is reflected in a physical change in hardness. In order to determine the effect of chromium on this natural condition, iron of the following composition was poured into molds of various thickness, reanalyzed, tested for hardness and the results plotted in diagrams Figs. 3, 4 and 5.

| Melt | TC | Si | Mn | P | S | Cr |
|---|---|---|---|---|---|---|
| | Per Cent | | | | | |
| A | 2.60 | 2.13 | 0.12 | 0.045 | 0.013 | 0.32 |
| B | 2.40 | 2.12 | 0.05 | 0.048 | 0.007 | 0.60 |

It will be noted from these diagrams that the curves are practically parallel, demonstrating that chromium exerts no influence on the sensitiveness of wall thickness. One other conclusion may be drawn from these curves and our experience with silicon or nickel: by adding or increasing the chromium in any gray iron we can refine the grain, increasing the physical properties and, if necessary, simultaneously counteract the hardening influence by introducing one of the graphitizing agents, silicon or nickel.

Before extensive tests were made it was expected that chromium addition would be disadvantageous with regard to quasiisotropy and sensitiveness of wall thickness, but these have shown that chromium has not this expected effect and they have proved that, of the normal iron elements, only silicon and phosphorus can be detrimental. The diagrams, Figs. 3, 4 and 5, are included through the kindness of E. Piwowarsky, E. Söhnchen and H. Nipper, of the University of Aachen.

### Effect of Chromium on Wear Resistance

Metal-to-metal abrasion tests were performed with various grades of cast iron, as shown in the following

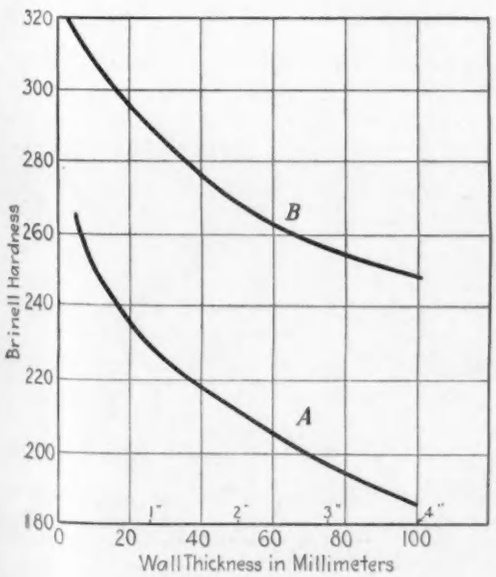



Fig. 4—Influence of chromium on Brinell hardness and wall thickness. Curve A: 2.6% T.C; 2.13% Si, and 0.32% Cr. Curve B: 2.4% T.C.; 2.12% Si, and 0.60% Cr.

Fig. 5—Influence of chromium on sensitiveness of wall thickness. Wall thicknesses: Curve No. 1 is 20 mm.; Curve No. 2 is 40 mm, and Curve No. 3 is 100 mm.

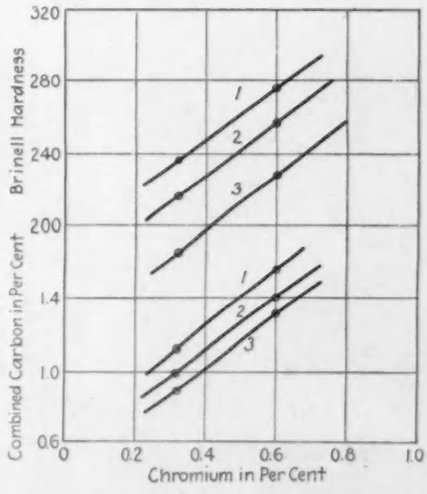


table. In this test cast iron cylinders of known weight were held against a rotating disk with a pressure of 20 lb. The disk was rotaing at 1000 r.p.m. The losses in weight given below are averages of five determinations on each sample.

| Sample | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| | Per Cent | | | | | |
| TC | 3.44 | 3.4 | 3.4 | 3.62 | 3.56 | 3.20 |
| GC | 1.82 | 1.84 | 1.69 | 2.76 | 2.60 | 1.60 |
| Si | 0.92 | 0.94 | 1.40 | 0.23 | 0.23 | 0.23 |
| Mn | 0.06 | 0.06 | 0.07 | 0.23 | 0.23 | 0.23 |
| P | 0.041 | 0.036 | 0.026 | 0.08 | 0.08 | 0.08 |
| S | 0.024 | 0.028 | 0.026 | 0.108 | 0.108 | 0.108 |
| Cr | ... | ... | 0.58 | ... | ... | 0.36 |
| Loss in gms. | 0.112 | 0.100 | 0.093 | 0.107 | 0.078 | 0.010 |

The analyses for carbon, silicon, etc., are not exactly similar; samples

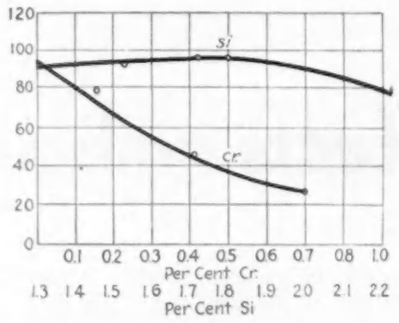
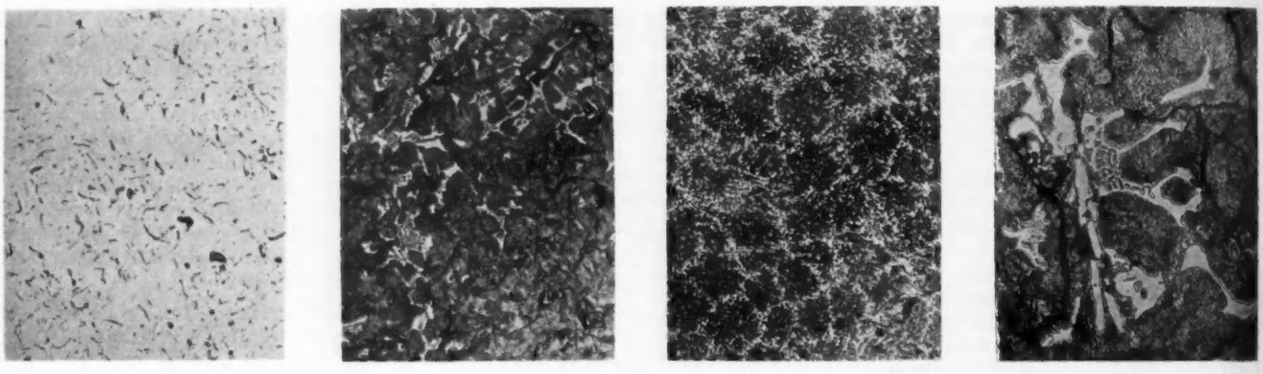


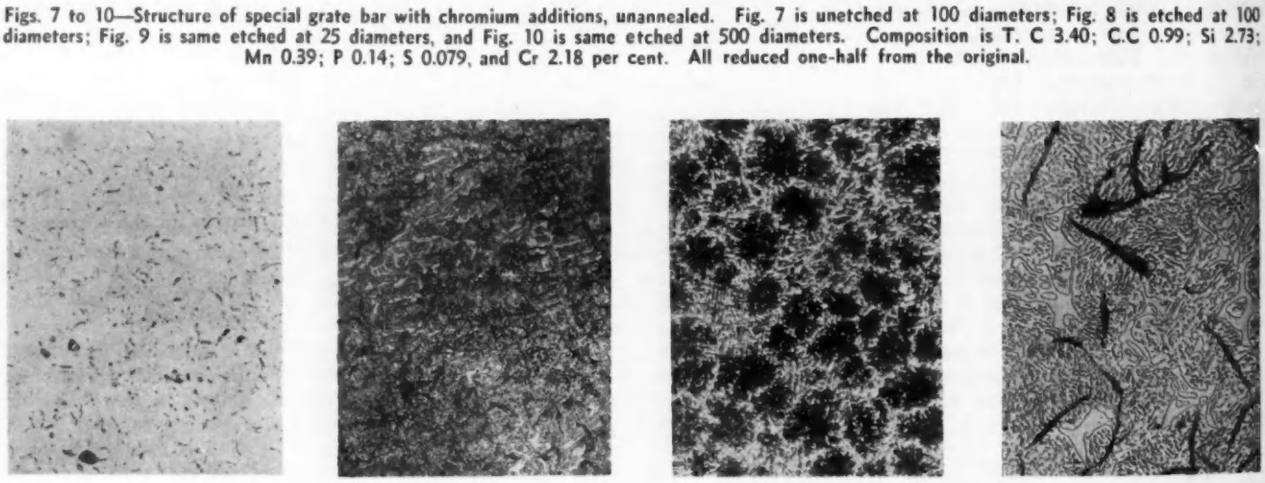

**Fig. 6—Reduction of the hardness during the annealing process for 3 hr. Difference in Brinell hardness before and after annealing.**

1, 2 and 3 are of medium silicon, and 4, 5 and 6 of low silicon. Sample 3, containing 0.58 per cent chromium, showed the least amount of wear of the medium-silicon irons. Sample 6 showed much the less wear of the low-silicon irons; the wear being only about 9 per cent of that shown by sample 4 containing no chromium.

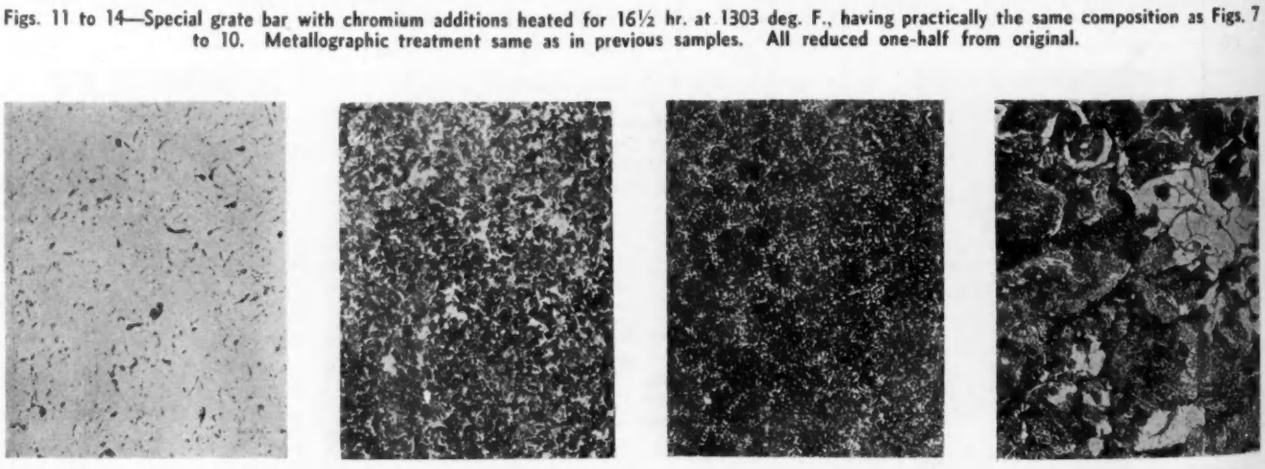
There is strong evidence that small amounts of chromium harden the ferritic matrix of the iron before carbides start to form. These carbides must be controlled according to the conditions to which the iron is to be subjected. In moderate size the carbide particles will increase wear



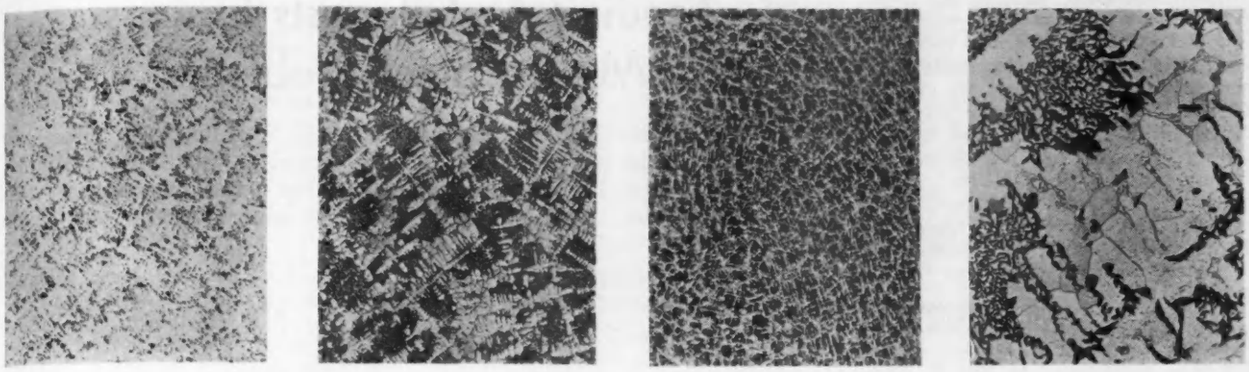
**Figs. 7 to 10—Structure of special grate bar with chromium additions, unannealed. Fig. 7 is unetched at 100 diameters; Fig. 8 is etched at 100 diameters; Fig. 9 is same etched at 25 diameters, and Fig. 10 is same etched at 500 diameters. Composition is T. C 3.40; C.C 0.99; Si 2.73; Mn 0.39; P 0.14; S 0.079, and Cr 2.18 per cent. All reduced one-half from the original.**



**Figs. 11 to 14—Special grate bar with chromium additions heated for 16½ hr. at 1303 deg. F., having practically the same composition as Figs. 7 to 10. Metallographic treatment same as in previous samples. All reduced one-half from original.**



**Figs. 15 to 18—Special grate bar, unannealed. Metallographic treatment same as in previous samples. Composition is T.C 3.44; C.C 0.53; Si 2.65; Mn 0.40; P 0.49; S 0.115 per cent and Cr none. All reduced one-half from the original.**



Figs. 19 to 22—Same material as Figs. 15 to 18 except heated for 16½ hr. at 1303 deg. F. All reduced one-half from the original.

resistance, but if too large might cause abrasion.

It must be remembered that in order to develop maximum resistance to wear, chromium additions must be made suited to the iron being treated.

### Effect of Chromium on Heat Resistance

Samples with different chromium content, with various silicon contents, were annealed for 3 hr. at a temperature of 900 deg. C. (1652 deg. F.), and after the anneal cooled slowly to room temperature. On these samples the hardness was determined and compared with the hardness determined before annealing.

It was shown that on the unalloyed samples the hardness of the annealed cast iron averaged 90 to 100 lower in Brinell units. That shows that the structure of the sample has become ferritic during the annealing process.

This relationship is illustrated in Fig. 6.

With chromium there was scarcely any difference, metallographically, between the annealed and unannealed samples, which proved that through chromium additions the breaking up of the pearlite at a temperature of nearly 900 deg. C. (1652 deg. F.) was retarded.

### Chrome Iron Grate Bars

In order to show the effect of chromium on the delay of breaking up pearlite and cementite more plainly, normal grate bars and chromium alloyed grate bars were subjected to a heat treatment at 745 deg. C. (1373 deg. F.) for the period of 16½ hr. The analysis is given below.

The photomicrographs, Figs. 7 to 22, show again the delay in breaking up pearlite and cementite with chromium additions and prove that the application of chromium is justified.

A study of the photomicrographs illustrates the effect of chromium on castings to be subjected to high temperatures. The chromium refines the grain of the casting and preserves its characteristics practically intact after the annealing operation. It will be seen that no growth of coarse graphite takes place in the chrome-treated irons. This, in turn, means that the grate bar does not grow and that the effects of oxidation are greatly lessened, even with small percentages of chromium.

As the growth of gray iron at high temperatures is known to be due to the breaking up of pearlite and cementite, it naturally follows that chrome-bearing irons do not grow, which has been well proved by practical experience.

| | TC | CC | GC | Si | Mn | P | S | Cr |
|---|---|---|---|---|---|---|---|---|
| Normal bar, unannealed. | 3.44 | 0.53 | 2.89 | 2.65 | 0.40 | 0.49 | 0.115 | ... |
| Normal bar, annealed... | 3.44 | 0.23 | 3.21 | 2.65 | 0.40 | 0.49 | 0.115 | ... |
| Alloyed bar, unannealed | 3.40 | 0.99 | 2.41 | 2.73 | 0.39 | 0.14 | 0.079 | 2.18 |
| Alloyed bar, annealed.. | 3.41 | 1.00 | 2.41 | 2.75 | 0.39 | 0.14 | 0.079 | 2.18 |

# Clean Coal Declared Essential to Production of Good Coke

REMOVAL of heavy gravity material from coal intended for coking purposes is a matter of prime importance, according to views expressed at a session, last week, on blast furnace problems, held as a part of the annual meeting in New York of the American Institute of Mining and Metallurgical Engineers. The consensus of opinion seemed clearly to be that however desirable it is to keep down the percentage of ash in the coal, it was perhaps fully as important to reduce the amount of the relatively heavy extraneous matter. This latter, such as shale, does not usually yield to the coal crushing as does the coal, leaving sometimes relatively large pieces but most important giving to the coke lines of cleavage with the result that there is produced too large a proportion of domestic sizes of coke and prodigious quantities of breeze.

Various experiences were recited. One of the country's large by-product coke plants, operated to make metallurgical coke, produced large amounts of both the domestic sizes and the fines although the ash content of the coal did not exceed 8½ per cent and the sulphur did not run over 1.15 per cent. The coal used in this case contained 2½ per cent to 3 per cent of the high-gravity material.

The industry, it was mentioned, will be given before long some more or less official paper on the subject. This is expected to urge the washing of the coking coal to eliminate the heavy matter to ½ per cent and to limit the ash, say, to 7 per cent and the sulphur to 1 per cent. The better coke will result, it was said, in 5 to 8 per cent less coke consumption in the blast furnace than formerly and less limestone, besides making it possible easily to control the sulphur in the pig iron to 0.20 per cent. One of the speakers told of coal analyzing not over 6 per cent ash and yet containing 5 per cent or more of the heavy gravity material. His decided preference was for 7 per cent ash coal if clean rather than for 4 or 5 per cent ash coal not cleaned.

It was brought out also that low oxygen coal, other things being equal, made the better coking fuel, and that in the case of high oxygen coal something more seemingly must be done besides removing the heavy stuff.

On the whole the meeting emphasized that a big step in the beneficiation of raw materials is under way. This topic was expounded in particular by James R. Campbell, Koppers Rheolaveur Co., Scottdale, Pa., who opened the discussion, and was rounded out by the contention of S. M. Marshall, consulting engineer, New York, who held that the requirements of the coal are tied up with the whole metal-

lurgical ensemble, namely the blast furnace as well as the coke oven. He told of experiences with high ash coke, of 10 per cent and over, being used successfully but with iron ore of over 60 per cent iron or with ore concentrates and sinter charged in such a way as to provide maximum uniformity in the permeability of the burden. The latter was described as covering the case of the furnace at Provo, Utah, where the concentrates are sorted as to size and one size at a time charged.

The discussion followed the presentation of a paper on evaluating coal for coke, contributed by Roy P. Hudson, Elk Horn Coal Corpn., Wayland, Ky. Besides Messrs. Campbell and Marshall, Howard P. Zeller, Jamison Coal & Coke Co., Greensburg, Pa., Charles C. Russell, chemical engineer, Koppers Research Corpn., Pittsburgh, and J. L. Joseph, Bureau of Mines, Minneapolis, were among those who discussed the subject at some length. Col. F. B. Richards presided.

Mr. Joseph also described experiments in deoxidizing sinter. Sinter from some twelve different sintering plants was obtained and an extended investigation was made to ascertain the different behavior of sinters classified as strong and dense, strong and porous and friable and porous. A sinter of the first class might be highly resistant to deoxidization even if relatively small, and the studies pointed to the need of close consideration of the relation of strength and porosity to get a sinter likely to behave most satisfactorily in the blast furnace.

A paper showing several months' records of the effect of the variation of coke ash on pig iron analysis was presented by Hjalmar W. Johnson, assistant superintendent of blast furnaces, Inland Steel Co., Indiana Harbor, Ind., and one on some gravity concentration experiments on Michigan iron ore was submitted by Frank J. Tolonen, Michigan College of Mines and Technology, Houghton, Mich.

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A manual for use in measuring thermal expansions by the light interference method has been compiled by the Bureau of Standards. It appears under the authorship of George E. Merritt, of the bureau, and is a pamphlet of 18 pages designated as research paper No. 515. It is for sale by the Superintendent of Documents, Washington, at 5c. a copy.

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A notable article on British coals, covering their origin, composition and classification, features the third issue of a recently established periodical, *Sands, Clays and Minerals*, published by Algernon Lewin Curtis, P. O. Box 61, Chatteris, England. The different coals, including anthracite, steam, coking, lignite and cannel coals and peat, are strikingly illustrated by a folded plate of colored halftones.

# Leading Metallurgists Discuss Molten Steel Problems

SUPPLEMENTING the report published in THE IRON AGE, March 2, covering the winter meeting of the American Institute of Mining and Metallurgical Engineers, the following paragraphs embrace the session on "Molten Steel Problems" and some news activities.

## New Thermocouple for High Temperatures

THREE interesting papers were presented and discussed at the session on molten steel problems.

A contribution to the difficult problems of determining elevated temperatures of metals was a paper by G. R. Fitterer, associate metallurgist, United States Bureau of Mines, Pittsburgh Experiment Station. His subject was "A New Thermocouple for the Determination of Temperatures Up to at Least 1800 deg. C."

The author gives full details of the theory of its construction and its advantages. It can only be stated here that the couple is a carbon-silicon-carbide union. The carbon, either graphite or amorphous, is the outside with the SiC on the inside, the union being, as usual, close to the lower end. It is water-cooled and is carefully insulated. The calibration is not difficult. The thermocouples can be made from 2 ft. to 8 ft. long.

As to applications, the temperatures of various liquid steel baths have been determined. Immersion in such baths for long periods did not affect the calibration. Interesting data have resulted. The new instrument fills the hope of steelmakers who have long wanted to measure open-hearth temperatures previous to tapping. This has been done by the author with highly satisfactory results. Thus temperature control of the steel is believed more possible.

The use of the couple is not limited to high temperatures but it is available for industries pertaining to fuel, ceramics, non-ferrous metals, and even cryogenic processes.

### Comments by Steel Men

In reply to questions in the discussion, Dr. Fitterer said that the reproducibility of these thermocouples is 99 per cent, that the hot junction is usually immersed about 1 ft. in the metal such as a steel bath and that the device has been used for measuring blast furnace metal. It was also stated in reply to a query that the thermocouple is reversible, i.e., C on the inside and the SiC on the outside. This is suitable for gases but not for steel.

Dr. H. H. Lester of the Watertown Arsenal, Watertown, Mass., termed this a valuable contribution. In making induction heats containing molybdenum it is of advantage in that pouring at a definite temperature is possible. Because he has found that the tip does not last long, he suggested a refractory protection or coating. Dr. C. H. Herty, Jr., Pittsburgh, suggested a clay graphite tube instead of plain graphite to which it was replied that this has not been used yet but that it has good possibilities.

## Inclusions in Steel

INCLUSIONS in steel is a live problem and an old one. J. J. Egan, W. Crafts and A. B. Kinzel, Union Carbide and Carbon Research Laboratories, Long Island City, N. Y., offered a new contribution to this subject in a paper, "Oxide Analysis by Iodine Extraction in Steel Making Problems." Control of inclusion content and quality of steel is largely dependent on a knowledge of the amount and distribution of the oxygen. Few analytical methods have been devised which are without serious limitations in accuracy, convenience and skill. Usually also two methods at least are necessary to determine total oxygen and constituent oxides.

In the paper the authors present an improved iodine extraction method, checked thoroughly from the standpoint of the analytical chemist and then rechecked from that of the metallurgist. A number of small heats of varying composition specially prepared were analyzed for total oxygen in the molten metal by the alumina method, and then for solidified material without aluminum by iodine extraction. Oxides of iron, manganese, silicon and aluminum were also determined by iodine analysis. The main part of the paper is a detailed description and discussion of the methods used. The authors have found that:

The iodine method gives total oxygen values which check accurately when obtained by the aluminum method for plain carbon and manganese steels. It should not be used in connection with steels containing the stable carbide-forming elements.

The distribution of the oxygen between the various oxide-forming elements, as determined by the iodine method, is in agreement with present ideas on the mechanism of steel-making reactions and is in line with present practice in manufacturing quality steels.

The iodine method may be used as an index of the cleanliness of steels by suitable evaluation of the ratio of $S:O_2$ to MuO plus FeO with respect to the total oxygen and sulphur contents.

The practicability and ease of application of the iodine method make it an admirable tool for the use of the steelmaker.

Following the presentation of the paper by Mr. Egan, Dr. Kinzel led

the discussion. He felt that the weighing of small quantities, or as low as 0.2 milligrams, was not difficult. The sum total of individual weighings check the total. They had found it not hard to dissolve 10 grams in 3 hr. Iodine is recovered by redistillation. All slags were attacked, but it is probable most inclusions are far from simple. In the iodine method the sulphur comes down as elemental sulphur. Total oxygen figures were surprisingly high when large percentages of silica were present.

Gratification was expressed by Dr. Herty, that the iodine method checked the alumina. He advocated the use of a combination of both methods. He has found that in the case of the Mn-Si-Al slag, the iodine method attacked these with about a 20 per cent loss of inclusions but that it was satisfactory for other slag.

Dr. John Johnston, director, research department, United States Steel Corpn., Kearny, N. J., asserted that the iodine and alumina methods do not absolutely check, but absolute values are not necessary. It is more important to be able to get reproducible results. He proposed that a set of carefully made samples be distributed by the Bureau of Standards and that different authoritative laboratories analyze these by several methods so as to secure more definite information. He had found that reduction by hydrogen gave results a shade higher than the vacuum fusion method.

## Inclusions in Wrought Iron

IN contrast to the fact that the demand for clean steel is increasing daily and that new ways to produce cleaner steel are being sought constantly, because inclusions affect the dynamic properties of steel and iron, it is surprising to note at the same time the continuing commercial development of new uses for wrought iron. This fact was emphasized in a paper, "Some Observations on the Effects of Inclusions on the Tensile and Dynamic Properties of Certain-Ferrous Materials" by F. R. Hensel and T. F. Hengstenberg of the research laboratories, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. The paper was presented by Mr. Brace of that laboratory.

Two types of wrought iron were compared with ingot iron. The former was selected as containing ductile matrices combined with different average sizes of inclusions of the rounded type. Ingot iron was used as an example of material containing minute and presumably angular inclusions. Space does not permit further details of the comparative tensile, impact, fatigue and other tests made. The authors find, however, that:

Inclusion stringers do not influence the physical properties to a marked extent when the stresses are parallel to the long axis of the stringers.

Material containing inclusion stringers shows large directional differences in physical properties, particularly in elongation, reduction of area and impact strength.

By comparing wrought iron with steel containing "ghosts," it was shown that both types of inclusion stringers have a similar effect on other physical properties.

If impact strength is to be used as a measure of the cleanliness of steel, proper consideration should be given to brittleness connected with agency phenomena.

The influence of inclusion stringers is not much more pronounced in a relatively hard matrix than in a softer material such as wrought iron, provided the inclusions are not located in regions of high stress concentration.

The microscopical examination of fatigue cracks in wrought iron provides a useful means of studying the mechanism of crack propagation in this type of material.

The investigation is believed to give some significant information on the effects of the stringer type of inclusion upon the dynamic properties of iron and steel. Although the data given seem to indicate very little influence of these inclusions when the stress applied is parallel to the stringers, it is our opinion that the problem requires further investigation, particularly regarding stress concentration with reference to size effects.

### Alloying Possibilities

During the brief discussion, a representative of the Reading Iron Co., Reading, Pa., in response to a question about alloying wrought iron, said that because the carbon is only about 0.05 per cent and often down to 0.01 per cent, there is a limit to the amount of alloying material to be added. It is necessary to make additions while the bath is liquid which is only about 2 hr. The refining takes place during the pasty condition of the material and chromium will not appear in the base metal. Copper and molybdenum do affect its physical properties beneficially but these are not comparable to their effect on steels.

## Research With X-Rays

A SESSION of a very high order was devoted to X-ray studies at which the following papers were presented: "A Study of the Homogeneity Limits of Wuestite (FeO) by X-Ray Methods," by Prof. E. R. Jette and Frank Foote, School of Mines, Columbia University, New York; "An X-Ray Study of Iron-Silicon Alloys Containing 0 to 15 Per Cent Silicon," by E. R. Jette and E. S. Greiner, also of Columbia, and "Studies Upon the Widmanstaetten Structure, IV—the Iron-Carbon Alloys," by R. F. Mehl, C. S. Barrett and D. W. Smith, Carnegie Institute of Technology, Pittsburgh.

### Non-Ferrous Technical Papers

Four sessions with 18 papers on the programs characterized the winter meeting of the Institute of Metals Division. The four sessions embraced the following topics: "Theoretical metallurgy," "theoretical copper and brass," "aluminum" and "copper and brass." Papers of a high order were listened to by a large representative attendance.

### Medals and Prizes Awarded

IT is the custom each year to award certain medals and honors at the annual banquet of the A. I. M. and M. E. This year the Robert W. Hunt Prize was bestowed on C. E. Sims and G. A. Lillieqvist in recognition of their paper, "Inclusions—Their Effect, Solubility and Control in Cast Steel," delivered at the convention last year. Both are members of the research department of the American Steel Foundries, Chicago.

The W. L. Saunders Gold Medal was awarded to Walter H. Aldridge of New York "for trained judgment in recognizing the values of undeveloped mineral resources, etc."

To James O. Elton, manager, International Smelting Co., Salt Lake City, Utah, went the James Douglas Medal "for conspicuous work in the treatment of smelter fume and in the production of electrolytic zinc, etc."

A blast furnace man, Hjalmar W. Johnson, received the J. E. Johnson, Jr., award for meritorious work in that field. The recipient is assistant superintendent, blast furnaces, Inland Steel Co., Indiana Harbor, Ind.

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# Airship Macon Supplied with Aluminum Vises

THREE light aluminum machinists' vises will be a part of the repair equipment of the Navy's newest airship, the U. S. S. Macon, now being built at Akron, Ohio. The vises, made by the Columbian Vise & Mfg. Co., Cleveland, are said to have the same efficiency as steel vises. They are identical in appearance with malleable iron vises and weigh 12 lb. each, as compared with 30 lb. for an ordinary vise the same size. They are of the swivel-base type, with 3-in. jaws. Aluminum castings are used for the front and back jaws and for the swivel base. Vises are equipped with heat-treated tool steel jaw faces, cold-rolled steel screw and handle, and malleable iron nut and swivel lock bolt. A steel washer separates the halves of the swivel base and a steel thrust washer is used on the main screw to prevent excessive wear. Because of the need of absolute reliability, all aluminum castings were subjected to X-ray inspection before assembly.

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Small tractors scarcely bigger than baby carriages powered with tiny motors can be built for economical operation on small farms of less than 20 acres, according to C. G. Krieger, engineer of the Detroit laboratories of the Ethyl Gasoline Corpn., jointly owned by the General Motors Corpn. and the Standard Oil Co. of New Jersey. Anti-knock gasolines and high compression engines permit the design of such units for high efficiency, he asserts.

# A. S. M. E. to Study Metal Cutting And Publish Practical Data

By R. C. DEALE
Secretary A.S.M.E. Subcommittee on Metal Cutting Data

THERE is growing realization that it is impossible for even the best mechanic to make use of the most effective combination of feed, speed, and depth of cut in even a small percentage of the entire number of cuts. Altogether there are 14 variables involved in the securing of the best cutting condition under a given set of circumstances, so that a real scientific study of the question is necessary to insure that maximum production rates are secured.

Frederick W. Taylor published the results of his extensive experimental work in "The Art of Cutting Metals," but the form in which they are presented was intended to point the way for further experimentation, rather than to present data for the use of the production executive. Carl Barth, in "A Supplement to the Art of Cutting Metals," added to this data, and outlined the method of constructing slide rules for making the information directly available in setting feeds and speeds for any given set of circumstances. Again the application of the data given in these articles fell far short of the extent to which it was hoped that it would be applied.

Other work, such as that carried out by the United States Bureau of Standards, while very valuable, has also been presented in such a way that it is not directly applicable to the setting of feeds and speeds under practical shop conditions. Further mathematical work, in most cases beyond the experience of the average production executive, as well as considerable further experimentation, is necessary before complete data are available for all conditions of metal cutting.

### First Data to Cover Simple Turning Tools

After studying conditions to meet this need, the American Society of Mechanical Engineers special research committee on cutting metals, has appointed a subcommittee on "Metal Cutting Data" under the chairmanship of King Hathaway, consulting engineer, New York. Active members include J. A. Carlin, vice-president, Hutto Engineering Co.; R. E. Flanders, vice-president, Jones & Lamson Machine Co.; W. W. Nichols, vice-president, D. P. Brown & Co.; R. T. Kent, vice-president, Divine Brothers Co.; G. A. Rentschler, president, General Machinery Corpn.; G. E. Schulz and R. C. Deale. Honorary advisory members include M. L. Cooke, consulting management engineer; C. N. Lauer, president, Philadelphia Gas Works; Admiral S. M. Robinson, Bureau of Engineering, United States Navy; C. M. Schwab, chairman of the board, Bethlehem Steel Corpn.; W. A. Viall, vice-president, Brown & Sharpe Mfg. Co., and F. J. Miller.

The committee is to undertake compilation and publication of data covering all common combinations of conditions in the cutting of metals. The work will be started with publication of data covering simple turning tools, such as used in engine lathes and boring mills.

It is hoped to include in such a volume data covering the use of the commercially available common analyses of steel, together with some data as to best tool shapes, rake and clearance angles, methods of grinding, and methods and temperatures for heat treatment. In addition there will be tables of cutting speeds which will give a standard tool life under different conditions of tool size, metal cut, depth of cut, and feed. Data will be given as to the method of adjusting these speeds when it is desired to secure a life between grinds other than that which has been adopted, as standard. It is probable that data will be included as to the power required by various cuts under different conditions, so that the individual shops may readily determine whether a given cut is within the capacity of machine on which it is desired to make it.

To make certain that such data will be of real value not only at the time of publication but also for a reasonable period thereafter, careful study must be made of cutting tools used and of metals commonly cut both at present and those that might come into use in the more or less immediate future.

### Need Cooperation of Metal-Working Industry

It will be necessary for the metal-working industry to cooperate if the data are to have general application. It is believed that the S. A. E. standard steel specifications may well be made the basis of steel definitions, although it is not known at present just which of these are used in large enough amounts to warrant inclusion of data covering that particular steel. In the case of the cast metals there is a greater difficulty, in that analyses, and consequently the physical properties, are not as definite as in the case of rolled stock. This is particularly true in the case of cast iron, and the bronzes, which are not usually annealed. The work of the A.S.T.M. will be studied, although it is believed that this will not be entirely adequate to distinguish between the various materials as regards their relative machineability.

Information is required on the following points:

1.—Method to be used in designating the various materials to be cut, in such a way that there may be no uncertainty in the application of data by shop production executives:

a. Steel bar stock
b. Steel forgings
c. Steel castings
d. Cast iron
e. Malleable iron
f. Brass and bronze bar stock
g. Brass and bronze castings
h. Nickel and monel metal
i. Aluminum, duralumin, etc.
j. Non-metallic plastics

2.—The analyses or hardness classes of the above to be considered in presenting the data.

3.—Any other materials that should be considered.

4.—Any tendencies in the use of steel bar stock, forgings, or castings that should be considered.

5.—The smallest number of grades of cast iron which will cover the usual practice of the industry for at least the next five years, and the best method of differentiating these grades so that there may be no confusion.

6.—Any tendencies in the use of cast iron that may cause significant changes within the next five years.

7.—Specific machining data, covering any or all of the materials used in the manufacture of machinery, would be of value. Results of tests, in which the life of the cutting tool between grinds is available, in addition to the usual data as to the size, form, and material of the tool, speed, feed, and depth of cut, and mechanical and chemical characteristics of the metal cut, would be particularly welcome.

The committee would appreciate letters from production executives and tool engineers of the various foundries and machine shops of the country, covering any or all of the foregoing points. To make the work valuable to machine shops of all classes, the data should be presented in a way intelligible to any foreman, and covering all materials that are used in appreciable quantity. An attempt to include too great a variety of materials will tend to increase the volume of the necessary tables to the point that they will be difficult to use. It is believed that there are considerable unpublished data in the hands of the machine shops of the country that would be of real value in furthering the work.

Communications in regard to any part of this proposed work should be addressed to King Hathaway, chairman, Committee on Metal Cutting Data, American Society of Mechanical Engineers, 29 West Thirty-ninth Street, New York.

# Putting the Question Mark to Work

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## Examining Idle Belts

***Are there any precautions which should be observed in starting up belt drives in a machine shop after an idleness of many months?*** **J. E. S.**

BELTING often deteriorates more rapidly when idle than when in regular use. In addition to this, other things may happen. Dirt may become lodged between belts and pulleys or a leaky bearing may saturate a belt with oil. In general it is well to examine all belts after a period of idleness before starting up the plant, as the occasion affords an opportunity for a general examination. Pulleys should be checked for alinement, belt fasteners for wear or breakage, belt lengths should be checked and all laps examined. A greasy belt may be restored by soaking it in gasoline or in carbon tetrachloride for about 24 hr. After this treatment, which is rather strenuous, the belt should be dressed with a lubricant. **L. E. Murphy.**

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## Testing for Carbon Content

***We would like to know how to make a simple test that will show fairly well the amount of carbon in merchant bars purchased from warehouses.*** **Cheney Weeder Co.**

IN our experience there is no simple test for determining the carbon content of bars, which is in any degree accurate at all times. A person who is engaged in continually grinding various materials will become familiar with the shape of sparks resulting and in many cases he is able to determine the carbon content fairly accurately by this means.

**Joseph T. Ryerson & Son, Inc.**

WE believe the spark test is the most suitable of the simple tests to determine approximate carbon content. Investigation of this type of testing indicates that with a little practice fairly accurate determinations of the carbon content are possible. We recently published a chart showing simple tests of this character for identifying alloys and metals.

**Electro Metallurgical Co.**

SO far as we know there is no quantitative chemical method for analyzing for carbon which is simple. The old grindstone spark test is crude, but in the hands of a good worker it is surprising how accurate a determination may be made.

**American Gas Association.**

Ed. Note.—For further information regarding the spark test, see page 953, in THE IRON AGE of Oct. 10, 1929.

## MARKETING ASSISTANCE

**WHAT new outlet is open to me for small forgings? Where can I secure information as to the sales possibilities for finished forgings? How much nickel-chromium steel is used in the paper industry? What are the possibilities of selling finished chrome-molybdenum parts to the textile machinery trade? These are some of the recent questions received in this department. Someone else may have solved your problem and would be glad to answer your questions. An attempt will be made to find an answer to any question in the metal-working field. Please address the Forum Editor, Iron Age Publishing Co., 239 West 39th St., New York City.**

▼ ▼ ▼

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## Low Expansion Alloy

***Do you know of a steel alloy having a low coefficient of thermal expansion?*** **R. C. H.**

ACCORDING to information we have available, the lowest coefficient of thermal expansion of any of the steels that we manufacture is found in our USS-27, a 27 per cent low-carbon chrome steel which, according to our investigation, shows an expansion figure of 0.0000056. Some other metals show a still lower coefficient of expansion and we believe Invar metal would fall in this group. Another metal might be Dilvar.

**Illinois Steel Co.**

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## Chromium Iron for Furnace Parts

***We have trouble with rapid oxidation of cast iron cap plates on our annealing furnaces.*** **M. H. K.**

CAP plates not only are subject to the effect of high heat but frequently encounter abrasion from the material which is being annealed. Our own investigation of this problem leads us to recommend a white cast iron with relatively high chromium content. It is possible to use this type of cast iron because no machining is required. The growth which occurs in ordinary cast iron at high temperatures can be greatly reduced by the addition of 1 to 1½ per cent chromium. However, in the case of cap plates for annealing furnaces, we recommend a cast iron containing from 3 to 3½ per cent chromium. The chromium addition is usually made to the cupola charges. In one case cap plates were produced with a chromium recovery of 95 per cent by using ferrochrome in the form of briquets specially designed for cupola additions.

**R. T.**

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## Cost of Quenching Oil

***I feel that we are using too much quenching oil in our heat treating department. Is there any way we can check this?*** **C. H. D.**

THE cost of quenching oil is the cost of oil per gallon times the number of gallons consumed per ton of steel quenched, and this cost varies with different oils and with different methods of quenching. Tests have shown a variation of nearly 500 per cent in the cost of quenching oil under different conditions. During a six months' test 256 tons were quenched in mineral oil with casual practice and 260 tons in a special quenching oil under carefully controlled conditions. In the case of the mineral oil, each ton of parts quenched consumed 14 gal. and in the case of the quenching oil each ton consumed 2.6 gal. Quenching oil losses may occur in several ways. The oil may boil away or vaporize by the action of the hot steel. An excessive amount of oil may be withdrawn with each piece of steel quenched. A loss may occur due to oxidation and a further loss results when the oil is dumped or changed after it has become too thick for further use.

**E. F. Houghton & Co.**

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## Describing Creep-Resisting Alloys

***Can you tell me a simple way to describe the relative creep-resisting properties of different alloys?*** **H. T. R.**

AT the present time creep-resisting alloys are in such a state of flux that no standard specifications, so far as we know, have been drawn up. In England the National Physical Laboratory has taken as the standard for limiting creep stress, the maximum stress to which a particular steel may be subjected at a given temperature without an elongation of more than 1/100,000 in. per hr. on a 1-in. gage length. This might be expressed as a creep rate of not more than $10^{-6}$ in. per hr.

**F. Rowlinson.**

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## Muriatic Acid Inhibitors

***Can you tell me if there is a satisfactory inhibitor to use for muriatic acid?*** **H. H.**

WE manufacture an inhibited muriatic acid known as Duclean, which has been found satisfactory wherever a product of this nature has been needed.

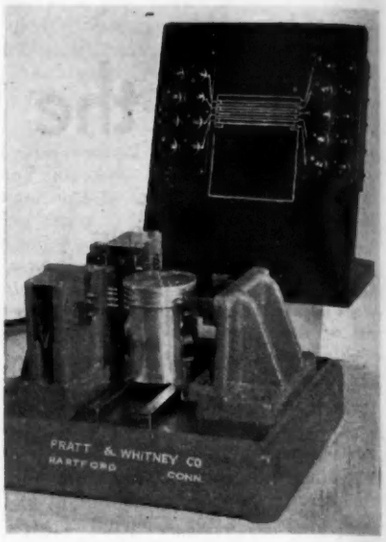
**The Grasselli Chemical Co.**

# Electriclimit Gage Checks Several Diameters Simultaneously

THE gage division of the Pratt & Whitney Co., Hartford, Conn., has developed a new electric gage for checking a number of diameters simultaneously. The particular gage illustrated is arranged to check nine diameters on an automotive piston. Five of these dimensions are outside diameters, and four are groove diameters. Checking is done by means of electric contacts arranged to engage the desired surfaces as the piston slides through. When the part is within the desired limits, no lights appear on the indicating board. If any dimension is oversize the corresponding green light flashes on and if it is undersize the red light appears.

After several weeks of service this gage has been found to reduce inspection time approximately 65 per cent, 864 pistons being gaged per hour as against 288 per hour previously. In addition, definite increase in uniformity and quality of inspection are claimed. Since the new gage eliminates the human element, a less skilled inspector is used for this work than formerly. The lights on the panel board either light or do not light, and the work is graded accordingly.

This type of electric gage has wide application. The general appearance of the gage will change for different jobs, but the fundamental principles remain the same. It is possible to hold limits closer than usual, and obtain satisfactory gaging at high speed.




**Nine diameters are checked simultaneously. Oversize is indicated by a green light and undersize by a red lighit.**

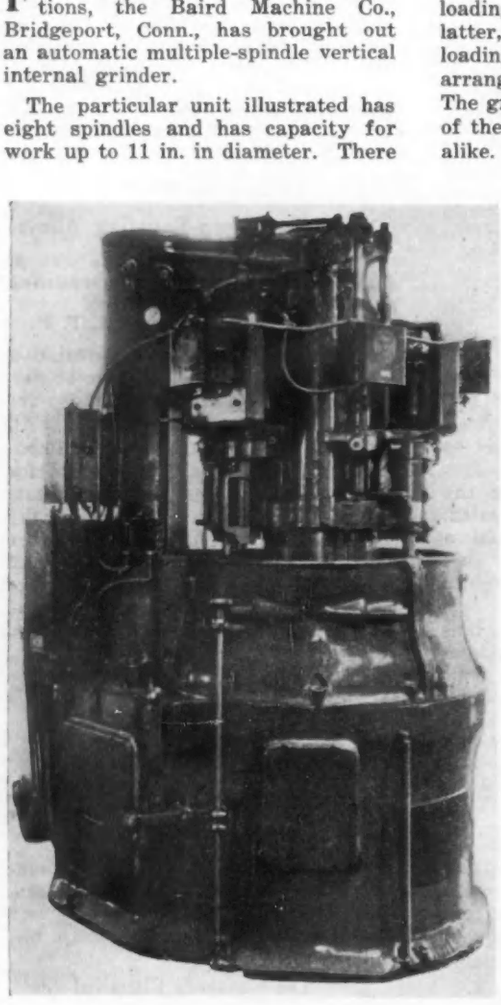
# Develops Automatic Multiple-Spindle Internal Grinding Machine

FOR quantity production operations, the Baird Machine Co., Bridgeport, Conn., has brought out an automatic multiple-spindle vertical internal grinder.

The particular unit illustrated has eight spindles and has capacity for work up to 11 in. in diameter. There are six grinding stations and two loading and unloading stations; of the latter, one station may be used for loading and unloading and the other arranged for polishing or gaging. The grinding wheels do not have to be of the same size nor are they dressed alike. Each wheel is automatically dressed and sized according to its need, independently of any other wheel. Speed and feed of each wheel are independent, and any wheel may be replacd in any point of the machine cycle without disturbing the other wheels. Roughing and finishing wheels may be used.

Different diameters may be ground in one set-up of the machine. The grinder can be arranged for double indexing, so that a piece of work may be first ground from one end and then ground from the other end in a second pass through the machine.

Automatic lubrication, anti-friction bearings and automatic safety controls are provided, and all mechanisms are inclosed. The machine occupies floor space of about 61 x 74 in., and is 106 in. high. It weighs approximately 27,000 lb.



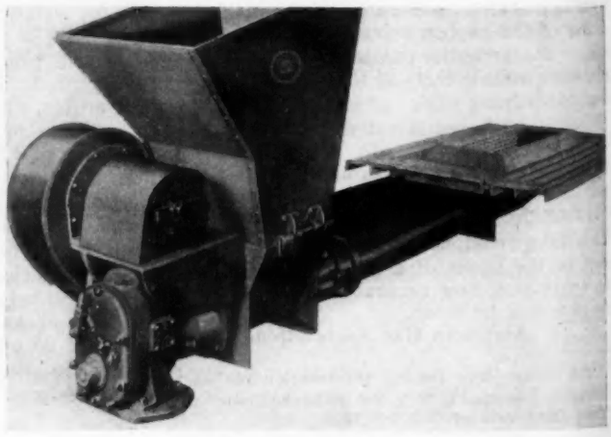
**EACH wheel of the automatic internal grinder shown at left is individually sized and dressed, the speed and feed being likewise independent.**

▼ ▼ ▼

**THE stoker shown below is for steam plants of 10 to 250 boiler-hp.**

# Automatic Stoker for Small Steam Plants

AN automatic underfeed screw stoker for heating plants and smaller steam plants, with boiler capacities from 10 to 250 boiler hp., is being



manufactured by the Link-Belt Co., Chicago.

Arrangement of the unit may be seen in the illustration. The motor mounting permits direct connection to the forced draft fan, and provides an easily accessible and compact assembly. A variable-speed transmission regulates coal feed, and a safety shearing pin provides for overload protection. The screw conveyor is made of chrome steel and all castings are of gray iron. Automatic electric controls are provided to permit operation to suit predetermined boiler pressures. The units are installed and serviced by the company or by its authorized distributers.

# Cut-Off Machine Operates with Piece Submerged in Bath

METALS, bakelite, glass, porcelain, rubber, asbestos, stone and other materials are cut at high speed by the Campbell Hudorkut (submerged cutting) machine illustrated, which has been placed on the market by Andrew C. Campbell, Inc., Bridgeport, Conn.

The piece is immersed in a bath of coolant and is cut by a thin wheel or disk operating at high speed. The work does not rotate during the cutting. The cut is clean and smooth, without burring, glazing or burning, and no further finishing is generally needed. Immersion of the work in the bath during cutting not only does away with the need of a suction fan for dust removal, but is said also to increase the life of the cutting wheel. The cutting stroke is automatic and is independent of the operator once the machine has been set. As the material is not visible to the operator, a pilot light is provided for indicating when the cut has been completed.

Loss of material in cutting is held to a minimum because the cutting wheel is extremely thin. As there is no side pressure on the wheel close tolerances can be held and square cuts made. The wheel is inclosed and there is very little slattering of the bath. Extensions may be added to both ends of the machine to accommodate very long pieces. The material is securely clamped in a quick-acting device and is located endwise by an adjustable stop that makes possible maintenance of close tolerances for length.

## New Roll Leveller Has Flexible Working Rolls

THE SUTTON ENGINEERING CO., Pittsburgh, has completed design of a new flexible working roll leveller by means of which pressure can be applied either to the center of the sheet toward both edges simultaneously, or toward one or the other edge of the sheet, as desired. Patented features provide for the use of spacer rolls which lie underneath and between the working rolls and above and between the top train of working rolls. It is stated that by means of these spacer rolls, backing-up rolls double the diameter of the working rolls can be used, thus providing a rigidity of backing up not otherwise obtainable.

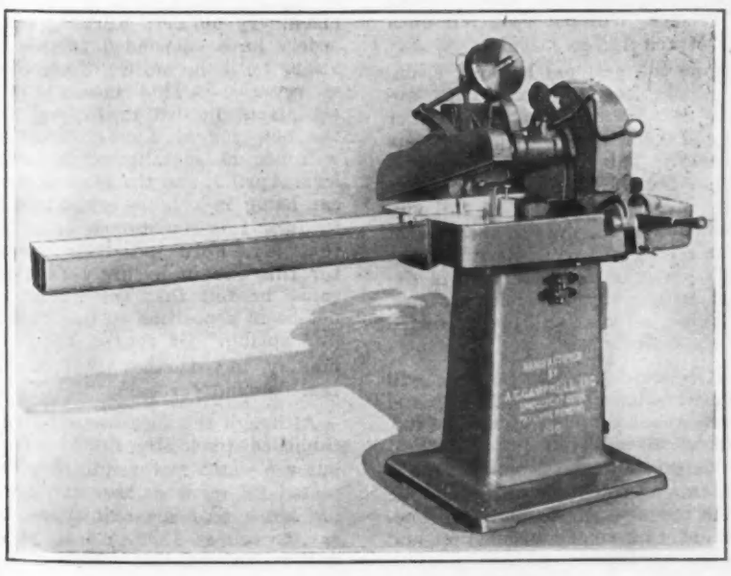
Because of their larger size, the backing-up rolls can be equipped with anti-friction bearings. As the working rolls are of small diameter they bend against the spacer and backing-up rolls, causing the backing-up roll bearings to carry the load.

On this new leveller, no corners of the backing-up rolls come in contact with the working rolls, as the backing-up rolls operate against the spacer rolls. In addition the backing-up pressure is more evenly distributed the full length of the working rolls by the spacer rolls. The backing-up rolls extend the full length of the working rolls, permitting the sheets to be levelled and the deflection controlled the full width of the machine. Adjustment for angling the top train of rolls is provided, and suitable indicating gages are furnished. There are only two bearings underneath each bottom working roll and these are of anti-friction type, arranged to exclude dirt.

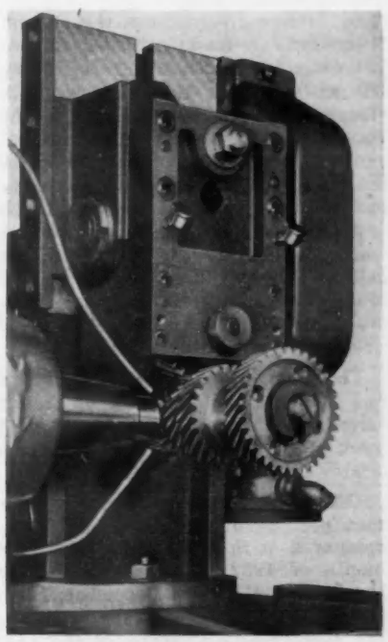
## Helical Gears Chamfered on "Peerless" Machine

WITH the improved work-head recently developed by the City Machine & Tool Works, Dayton, Ohio, for its Peerless gear tooth chamfering machine, spiral or helical gears, as well as spur gears, may be rapidly and economically chamfered. With a slight change, the head can be applied to all No. 3 Peerless machines.

The head can be quickly adjusted for gears of various diameters. It has an anti-friction bearing idler drive, and provision is made to meet the unusual thrust of helical gears. The illustration shows the tool in position for chamfering teeth of automobile helical transmission gears.



THE cut-off machine at left employs a thin, high-speed wheel, which cuts material that is immersed in coolant.



THE improved work-head of the Peerless gear chamfering machine is shown above. The tool is in position for chamfering helical transmission gears.

# OFF THE ASSEMBLY LINE

# Banking Holiday Brings Automobile Production Almost To Standstill

DETROIT, March 7.

THE suddenness with which the banking storm swept down on the country, crippling temporarily its financial structure, has dazed the automobile industry, but not yet brought production to a halt. General Motors, Ford, Chrysler and other major motor car companies are continuing to operate their plants, but their plans for the immediate future are dependent upon retail demand, upon the ability of dealers to finance the purchase of cars and upon satisfactory arrangements for meeting payrolls and other financial obligations during the duration of the national emergency.

Continental Motors Corpn. has suspended work at its Detroit and Grand Rapids plants because dealers and customers cannot pay cash for cars. It has always been the custom of motor car manufacturers to collect cash from the dealer for every car as it leaves the factory. Obviously this is impossible with the entire country deprived of normal banking facilities. In numerous cases the large automobile finance companies are stepping into the breach and temporarily shouldering the load which dealers usually bear. This is said to be especially true of General Motors Acceptance Corpn. for General Motors cars and Universal Credit Co. for Ford cars.

The grave financial situation has had a devastating effect on retail sales which was reflected the past week in curtailments of March assemblies by a number of companies.

Official figures for January show that production totaled 133,472 cars, compared with 123,075 in the same month of 1932. Thus January was the first month since December, 1930, in which output was larger than in the corresponding month of the previous year. February assemblies now are estimated at 125,000 cars, against 122,895 in the same month of last year, continuing the gain registered in January. Early projected schedules for March indicated that for the third consecutive month last year's record would be surpassed, but the picture has been entirely changed by banking developments. It is literally a fact that the industry is in a state of confusion, without definite plans until it knows what and when banking facilities will be available. Even then there will be a tendency to move slowly until the hysteria which has swept the country has spent its force and some tangible evidence of retail demand is unearthed.

### Chevrolet Curtails Sharply

The banking difficulties as they have affected Chevrolet are of special interest because of Chevrolet's preeminence in the industry. As the banking holiday spread from State to State, Chevrolet was compelled to reduce assemblies in the affected areas so that total output in February was 45,077 units, whereas the goal had been 50,000 or more. Curtailment of operations resulted in the issuance of hold-up orders on steel and parts which were to have been shipped to Chevrolet plants this week. The unexpected drop in Chevrolet's tonnage was a blow to steel mills, as Chevrolet for some time has been the country's largest automotive consumer. It is believed that further steel releases will not be given until about March 15.

Despite the national banking situation, Chevrolet has decided to announce next Saturday a new smaller car to be known as the standard six Chevrolet. This car, which heretofore has been identified in the trade as the Mercury, will be of full size and will follow the lines of the present master series, but will be without the latter's de luxe features. It is designed principally for business use, and sales efforts will be directed mainly at fleet users and salesmen.

It is believed that the new car will have a wheelbase of about 107 in. and will sell at a base price of about $400. Chevrolet already has put 15,000 of these cars into dealers' hands. W. S. Knudsen, president, states that he expects the new car to make up one-fourth of Chevrolet's production and sales during 1933.

Chevrolet's February record was remarkably good in spite of the financial cloud hovering over many States. Its output of 45,077 units was a gain of 7.3 per cent over the 42,008 units in the same month of 1932 and brought the total of 1933 models produced since Dec. 17 to 150,000. In the first two months of the year Chevrolet built 15,200 more units than in the corresponding period of last year. Retail sales in the first 20 days of February surpassed those in the same period of 1932.

### Ford Proceeding at Fair Rate

Ford has been pushing ahead at a fair rate in an effort to stock dealers with the new V-eight and the new four, which has the same chassis as the eight. Murray is moderately busy making Ford frames at its Ecorse, Mich., plant, while Murray and Briggs are gradually expanding their body production. Ford is now understood to be turning out over 1000 units a day, five days a week. Steel releases have been in small lots from day to day. Indications are that further delays will be encountered in getting the small car (model 44) onto the market. Engineering changes still are being made, and in some cases machinery builders working on Ford orders have suspended further operations until the nature of the changes is revealed. This means that the equipment needed in tooling up for the new job at Ford's Rouge plant will not be installed there until at least April 1, and the likelihood of the car being in volume production prior to June 1 is remote. It is no secret that Mr. Ford has been preparing for this car in leisurely fashion because he felt that the public would not be in a position to buy cars until late spring. Of course, the banking holiday has further postponed any real demand for cars.

Although the fact was long ago established that Mr. Ford intends to put a V-eight motor into the contemplated 105-in. wheelbase car, few people know that a small four-cylinder car, to sell at $300 or less, probably will be in the line. This will give

the Ford company complete coverage in the low-price field from $300 up to $500.

**Chrysler Releases Steel Orders**

Chrysler Corpn. gave some steel releases the past week, principally for its Plymouth division. Plymouth's shipments to dealers in the last half of February were almost double those in the first half. Deliveries of raw materials to some Chrysler units, in certain cases, have been deferred two weeks beyond the original date. Willys-Overland remains closed and will not be permitted by the Federal court to proceed with its truck contract unless International Harvester advances cash to meet labor costs and other expenses. The Federal judge specified that the company shall not pay its workmen a lower wage than prevailed prior to the receivership. Several thousand workmen have not received two weeks' pay from the Willys-Overland Co. and last week picketed the plant as a protest.

## Ground Broken for Golden Gate Bridge

More than 200,000 persons witnessed the ground breaking ceremonies, held at San Francisco on Feb. 26, for the $35,000,000 Golden Gate bridge, which will be the longest single clear span in the world, 4200 ft. long, three times the length of the Brooklyn bridge and 700 ft. longer than the greatest span ever built, the George Washington bridge at New York. The minimum vertical clearance at center will be 200 ft. above mean high water.

The towers will be 121 ft. wide at the bottom and 740 ft. above mean water, the highest and largest bridge towers in the world. The steel in the two towers alone is more than the steel in the entire Quebec bridge—one of the world's greatest bridges—and in addition, there will be 9000 tons of steel in the approach spans and steel viaduct.

The two main cables each will be 36½ in. in diameter, 7660 ft. long between anchorages, weigh 11,000 tons and contain 27,572 separate wires. The load supporting capacity of the two cables will be 215,000 tons and will have a live load supporting capacity of 12,700 tons, which would allow the bridge to be packed with six lanes of vehicles and both sidewalks to be fully loaded, for the full length of the span.

The Golden Gate bridge will be unique in that it will be the first in which the net work of transverse bracing between tower posts is eliminated and the towers portal-braced throughout, making the tower appear to be a great doorway. The San Francisco pier is the first bridge pier to be built in the open sea under methods specially devised, among which will be a steel and concrete cofferdam, built in place, section by section, 30 ft. thick at the bottom, with its top 15 ft. above water, remaining in place as a permanent fender to enclose the pier and protect it from possible impact of passing ships.

The Golden Gate bridge will require more than 100,000 tons of steel, taking rank second in tonnage only to the George Washington bridge. The construction period is four years.

## OBITUARY

JOHN MCGEORGE, of Cleveland, a prominent mechanical engineer and designer of steel plant equipment, was killed when struck by an automobile on Feb. 27. He was 81 years of age. Mr. McGeorge was for a number of years chief engineer of the Wellman-Seaver Engineering Co., now the Wellman Engineering Co., Cleveland, and while associated with that company performed outstanding engineering service in designing the rolling-top, open-hearth furnace, an open-hearth charging machine and various other steel plant equipment.

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DAVID ALFRED BARKLEY, manager of sales of the pig iron, ferromanganese, coke, coal, stone and by-products division of the Bethlehem Steel Co., died March 3 at his home at Bethlehem, Pa. Mr. Barkley formerly was associated with the Lehigh Coke Co., taken over in 1917 by the Bethlehem Steel Co., since which time he had been employed by the latter. He was 51 years old.

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JOHN D. THOMAS, formerly superintendent of the Homestead Works, Carnegie Steel Co., died at his home in Wheeling, W. Va., on March 3. He was for many years superintendent of the Mingo, Ohio, plant of the Carnegie company, but was in charge of the Homestead works during the 1892 strike. Mr. Thomas had retired many years ago.

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THOMAS P. DAVIES, formerly chief engineer at the Duquesne, Pa., works of the Carnegie Steel Co., died at his home in Duquesne on March 1, aged 57 years. He was a graduate of the old Western University of Pennsylvania, now the University of Pittsburgh, and had served the Carnegie company for more than 30 years, until his retirement last September.

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J. L. LANE, who was identified for 30 years with the American Steel & Wire Co. and in the sales department at Birmingham for the last six years, died on Feb. 26.

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FREDERICK W. BUERSTATTE, sales manager, Hofius Steel & Equipment Co., Seattle, Wash., died suddenly of heart disease Feb. 25. He was born in Manitowoc, Wis., in 1880 and was graduated from the mechanical engineering course at the University of Wisconsin. Before joining the Hofius company in 1918, Mr. Buerstatte was connected with the Chicago & North Western railroad and the International Harvester Co., later becoming professor of mathematics at the University of Missouri and the University of Washington.

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FRANK HORSBURGH, founder and president of the Horsburgh & Scott Co., Cleveland, gear manufacturer and one of the deans of the gear making industry, died March 4, aged 78 years. Mr. Horsburgh was a native of Scotland and went to Cleveland when he was 25 years of age. In 1888 he entered in partnership with Thomas Scott as general millwrights and machinists. With the introduction of electric street cars the firm specialized in the manufacture of gears. In 1898 Mr. Horsburgh purchased the interest of his partner and formed the present Horsburgh & Scott Co. He was one of the founders of the American Gear Manufacturers Association and for several years treasurer of that association. He leaves two sons, T. P. and R. G. Horsburgh, respectively vice-president and general manager of the Horsburgh & Scott Co.

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D. R. MATHIAS, for many years general superintendent at the Joliet works, Illinois Steel Co., died on Feb. 4 at his home in Joliet, Ill. He retired from active service several years ago.

## Declares Foreign Steel Costly to Pacific Coast

William A. Ross, vice-president of the Columbia Steel Co., subsidiary of the United States Steel Corpn., recently stated that in the years 1930, 1931 and 1932 there was imported into the Pacific Coast territory 216,177 gross tons of foreign steel products that could have been manufactured by the steel mills in that territory. This would have meant an outlay for raw materials of $3,958,012.79; a freight revenue to railroads of $984,013.92; to the oil companies for fuel oil, $157,508.72; for gas and power, $1,200,383.21; for miscellaneous supplies, $2,228,395.46. Above all, it would have meant in labor, $3,455,198.07, which would have meant the employment of 33,939 men for four weeks at five days per week at an average rate of $5.09 per day. Thus the importation of foreign steel during the last three years has meant a total loss of $11,983,512.17 to Pacific Coast industry.

A recent addition to the Fairfield line of idlers for belt conveying systems is a Timken roller bearing idler of 6-in. diameter, available in both the troughing and return roller types. These idlers, which are built by the Fairfield Engineering Co., Marion, Ohio, take belts ranging from 14 to 60 in. in width.

# Steel Ingot Production Gained 14.7 Per Cent in February

## Daily Rate Is Best for Any Month Since Last April—Percentage Rate Is 20.39 Compared With 17.78 in January

STEEL ingot output in February, at 44,378 tons a day, showed a gain of 14.7 per cent over the January daily rate of 38,704 tons. The increase was smaller than in the previous month, when operations registered a gain of 19.1 per cent over the December average.

February operations are computed by the American Iron and Steel Institute as representing 20.39 per cent of capacity, compared with 17.78 per cent in January and a low for the depression of 14.26 per cent in August, 1932. The February average was the highest since April, 1932, when operations were at a 22.02 per cent rate.

Total output in February was 1,065,080 tons, compared with 1,006,297 tons in January. The number of working days in February was 24, against 26 in January.

Normal is the average monthly production during the last three calendar years. Based on the new normals production in January was 49.9 per cent of normal compared with 31.1 per cent in December. New business was 53.3 per cent against 25 per cent the previous month.

Foundries in the Eastern district including New England, New York and New Jersey operated at 52.9 per cent of normal in January against 26.5 per cent in December. Those in Pennsylvania, Michigan, Ohio, Indiana and the South operated at 43.8 per cent compared with 3.2 per cent the previous month. Operations in Wisconsin, Illinois and the territory west of the Mississippi River were 56 per cent in January against 31.7 per cent in December. Chicago district showed a gain to 52.1 per cent in January compared with 33.1 per cent in December.

PRODUCTION OF OPEN-HEARTH AND BESSEMER STEEL INGOTS
(Gross Tons)
Reported for 1932 by Companies Which Made 95.33 Per Cent of 1931 Ingots

| 1932 | Open-Hearth | Bessemer | Calculated Output All Companies: Monthly | Calculated Output All Companies: Daily | No. of Working Days | Per Cent Operation |
|---|---|---|---|---|---|---|
| January | 1,230,661 | 160,633 | 1,459,450* | 56,133* | 26 | 25.96* |
| February | 1,232,568 | 157,067 | 1,457,710* | 58,308* | 25 | 26.96* |
| March | 1,149,307 | 193,944 | 1,409,054* | 52,187* | 27 | 24.13* |
| April | 1,036,227 | 144,197 | 1,238,250* | 47,625* | 26 | 22.02* |
| May | 950,785 | 103,593 | 1,106,030* | 42,540* | 26 | 19.67* |
| June | 755,123 | 100,249 | 897,275 | 34,511 | 26 | 15.96 |
| July | 652,650 | 102,872 | 792,533 | 31,701 | 25 | 14.66 |
| August | 696,206* | 97,323* | 832,402 | 30,830 | 27 | 14.26 |
| September | 804,556 | 124,970 | 975,061 | 37,502 | 26 | 17.34 |
| October | 885,773 | 132,876 | 1,068,550 | 41,098 | 26 | 19.00 |
| November | 838,559 | 128,844 | 1,014,794 | 39,031 | 26 | 18.05 |
| December | 722,522 | 82,652 | 844,618 | 32,485 | 26 | 15.02 |
| Total | 10,954,937 | 1,529,220 | 13,095,727 | 41,973 | 312 | 19.41 |

*Revised.
These figures of "per cent of operation" are based on the annual capacity as of Dec. 31, 1931, of 67,473,630 gross tons for Bessemer and open-hearth steel ingots.

| 1933 | Open-Hearth | Bessemer | Calculated Output All Companies: Monthly | Calculated Output All Companies: Daily | No. of Working Days | Per Cent Operation |
|---|---|---|---|---|---|---|
| January | 850,303 | 109,000 | 1,006,297 | 38,704 | 26 | 17.78 |
| February | 888,560 | 126,781 | 1,065,080 | 44,378 | 24 | 20.39 |

## Gray Iron Business Gained in January

Some improvement in the gray iron foundry industry is shown in the January report of the Gray Iron Institute. However, the percentage figures do not show an accurate comparison with December because these are based on normal capacities, which were changed at the start of the new year.

## R. F. C. Loans Approved For Various Projects

WASHINGTON, March 7.—Reconstruction Finance Corporation loans approved last week covered waterworks, electric power and merchandise market projects which will require small tonnages of reinforcing steel, cast iron pipe and tank material.

The loans included:

Charlotte, N. C., $140,000, of which $75,000 will be used to purchase building materials in construction of a market.

De Baca County, N. M., $135,000, of which $22,000 will be spent for materials, including reinforcing steel, in construction of diversion dam.

Radford, Va., $129,000, of which $70,000 will be spent principally for concrete materials and hydroelectric equipment.

Sterling, Colo., $110,000, of which about $12,000 will be spent for reinforcing steel, etc., for reservoir work.

Coal Grove, Ohio, $62,000, of which $31,000 will be spent for about 480 tons of 2-in. to 10-in. cast iron pipe, a 100,000-gal. standpipe, etc., in construction of waterworks system.

Owingsville, Ky., $49,000, of which $29,000 will be spent principally for cast iron pipe, pumps, miscellaneous filter equipment, a 75,000-gal. storage tank, etc., in construction of waterworks system.

Union City, Ind., $45,000, of which $31,000 will be spent for 1500-ft. of 8-in. cast iron pipe, a 200,000-gal. steel storage tank, and miscellaneous electrical equipment in improving waterworks system.

Ilimo, Mo., $42,000 of which $25,000 will be spent for about 18,000-ft. of 2-in. to 8-in. cast iron pipe, a 75,000-gal. elevated steel tank, etc., in construction of waterworks system.

Williamsburg, Ohio, $35,000, of which $20,000 will be spent for approximately 380 tons of cast iron pipe, pumping equipment, a 100,000-gal. steel storage tank, etc., in construction of waterworks system.

Pima, Ariz., $13,500, of which $9,400 will be spent principally for about three miles of 6-in. riveted steel pipe and fittings in improving waterworks system.

## Tulsa Steel Co. In Receivership

The Tulsa Steel Co., Sand Springs, Okla., manufacturer of steel bars, has been placed in receivership by the Federal District Court of Tulsa, Okla. William Matthews, John A. Cheadle and Travis I. Milsten were appointed receivers and will continue to operate the company. The receivers announce that they are negotiating for a loan, the proceeds of which, if procured, will be used to complete the orders which the company now has on hand.

## New Company Acquires Adriance Machine Works

The Callahan Can Machine Co., Inc., 80 Richards Street, Brooklyn, which was incorporated on Dec. 31, 1932, has acquired the Adriance Machine Works, Inc., which has for some time been operated under a receivership. T. E. Callahan, president, and James B. Rohde, secretary-treasurer of the Callahan Can Machine Co., purchased the assets of the Adriance company last December and have formed the Callahan company to operate the business.

The products of the new company will be the same as those of the Adriance company, namely, presses, dies, sheet metal-working machinery, automatic can machinery and machinery for making crown caps, as well as special machinery. Repair parts for Adriance machines will be carried in stock by the new company.

# ... PERSONALS ...

HOWARD V. CLARK has been appointed assistant manager of sales in the Detroit district for the Carnegie Steel Co., Pittsburgh. PHILIP M. GUBA, formerly assistant New York district manager for the Republic Steel Corpn., was appointed to a similar position with the Carnegie company a short time ago. Mr. Clark was graduated from the United States Naval Academy in 1920, and after two years' service with the Navy, was identified for a short time with the Procter & Gamble Co., Cincinnati. He later attended the Harvard Law School, and subsequently became identified with the Carnegie company in July, 1927. In August, 1930, he joined the sales organization of the Great Lakes Steel Corpn., Detroit, but returned to the Carnegie company's Detroit sales organization in September, 1932.

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G. L. FISK, formerly chief engineer of the Mesta Machine Co., Pittsburgh, has become identified with the Blaw-Knox Co., Pittsburgh, as assistant to the vice-president. Mr. Fisk has had a wide and varied experience in the field of steel mill engineering and construction. Prior to his connection with the Mesta company, he served as chief engineer for the Pittsburgh Crucible Steel Co. and the Crucible Steel Co. of America. He spent a year, from 1911 to 1912, in India as resident engineer at the plant of the Tata Iron & Steel Co. The next three years he was associated with the Cambria Steel Co., and served the Central Iron & Steel Co. from 1916 to 1923.

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FLOYD O. TANNER, whose appointment as director of manufacturing for the Chevrolet Motor Co. was announced in the Feb. 23 issue of THE IRON AGE, is relieving CHARLES E. WETHERALD, vice-president and general manufacturing manager, of some of the responsibility he has assumed as immediate supervisor of the 12 domestic plants now under Chevrolet's direction. Under the new set-up, Mr. Wetherald heads all factory activities, with Mr. Tanner as manufacturing aide and W. C. WILLIAMS, JR., continuing as assembly plant supervisor. Directly responsible to Mr. Tanner are ARNOLD LENZ, assistant general manufacturing manager in charge of Flint, Saginaw and Bay City operations; HUGH DEAN, assistant general manufacturing manager in charge of Detroit and Toledo operations; and P. H. MACGREGOR, named factory manager at Pontiac succeeding Mr. Tanner. Mr. Tanner has had 30 years of manufacturing experience and has been with Chevrolet continuously since 1916, when he went to Flint as chief inspector.

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WILLIAM F. DIESEL, for the past 10 years vice-president of the Sargent & Greenleaf, Inc., Rochester, N. Y., has been elected president, succeeding the late William R. Hill. CLARENCE W. QUINN, who has served the company for many years as secretary and assistant treasurer, has been made vice-president and treasurer, and JAMES G. DALE has been appointed secretary.

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F. J. PAGE has been appointed Chicago district manager, with offices at 407 South Dearborn Street, for the Euclid-Armington Corpn., Euclid, Ohio. He will have charge of crane and hoist sales in the sections of the States of Illinois, Indiana and Michigan closest to Chicago.

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WILLIAM H. WOODIN, who has become Secretary of the Treasury in President Roosevelt's Cabinet, has resigned from his executive positions with the American Car & Foundry Co. and affiliates. CHARLES J. HARDY was elected to succeed Mr. Woodin as president of the American Car & Foundry Co. and its affiliates. Mr. Hardy has been general counsel to the company for 25 years. WILLIAM C. DICKERMAN, president of the American Locomotive Co., was elected a member of the executive committee of the American Car & Foundry Co., the American Car & Foundry Export Co. and the American Car & Foundry Securities Corpn.

**RUDOLPH FURRER**

**Recently appointed assistant to the operating vice-presidents, National Tube Co., Pittsburgh, as announced in The Iron Age, last week.**

FRED J. ESSLINGER has joined the technical staff of The Champion Rivet Co., Cleveland. He will be engaged in various research capacities, devoting his efforts primarily to the development of welding rod coatings for particular applications. Mr. Esslinger received his technical training at Friedrich Wilhelm and the Technical Universities of Berlin. He was formerly with the Petroleum Iron Works, Sharon, Pa., in charge of its metallurgical laboratory and welding rod developments.

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EARL C. SMITH, chief metallurgical engineer of Republic Steel Corpn., Youngstown, addressed a meeting of the American Society for Steel Treating at Muncie, Ind., March 1, on "Alloy Steels from the Manufacturer's Viewpoint."

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W. H. MCCLELLAND has resigned as director and sales manager of the machinery department of the Strong, Carlisle & Hammond Co., Cleveland, with which he has been connected for 26 years. He had been sales manager for 15 years. He has been succeeded as sales manager by G. J. ZIMMERMAN, who has been in charge of the company's used machinery department and supervision over its Detroit sales office.

H. V. CLARK

G. L. FISK

F. O. TANNER

# ... LETTERS TO THE EDITOR ...

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*Editor, The Iron Age:*

The writer has been quite interested in some of your editorials on price cutting and is prompted to write you with the suggestion that you consider composing an editorial which we feel would be very helpful.

The theme, as we see it, would be to preach to ironworkers and the structural steel people the country over that the very best thing for the whole industry would be for everyone figuring contract work of any kind to insist that a small profit at least of some amount be added to every single job figured.

Just as soon as this can be done we feel certain that the effect will be very noticeable and that there will be a tendency to stabilize prices so that serious price cutting will be stopped and the accompanying losses reduced. This will enable us to put men back to work and permit us to pay our laborers a better wage, which in turn will permeate through all lines of activity necessary for our living.

This is a suggestion and we would like to see one in your position give it some thought and enlarge upon it.

*The Hussey Mfg. Co.,*
*P. W. Hussey, General Manager.*

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*Editor, The Iron Age:*

Your most timely editorial entitled "Stop, Look, Listen and Act," in THE IRON AGE is to be highly commended.

The writer has been selling structurals for over 25 years for one of the smaller companies and, therefore, has been through several so-called depressions. Conditions could be corrected in a few months if we would discard the old slogan—"Live and let live," and in its place substitute "Live and help live." By this I mean one price for all and all for the one price. Make it and live up to it.

We used to boast of leaders in our industry. What has become of them? As you say—all they have to do is to give the word, and make us live up to it. No extended contracts, but just common-sense sales talks. There is not a buyer but wants to get busy again, and as soon as he knows we mean business, watch the smoke rise again. We want our companies to make a profit, because we profit thereby. We had a Pittsburgh base and never were we asked to give the big fellow a cut. They all expected to pay the going price. It was not a high one, but one that gave every mill a profit. Today it is dog eat dog, and we were supposed to have outgrown this cave man policy years and years ago.

As salesmen we would be only too willing to let our personality, the service our companies render and our ability seek the business instead of trying to name the lowest price. Keep up your good work and maybe it will sink in where it will do the most good. Cooperative competition and helping the other fellow to live should be our watchwords. More power to you and believe us the salesmen who have been in the game for some years will be only too willing to do their share.

*C. G. M.*

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*Editor, The Iron Age:*

I desire to commend your editorial, "Stop, Look, Listen and Act," in the issue of THE IRON AGE of Feb. 16. You are entirely correct in your statement that continual cutting of prices will not add one ton to the total consumption of steel and that this course of action leads only to an aggravation of the present chaos.

However, simply fixing a *minimum* price and holding to it will not of itself entirely correct the situation. Just so long as one fabricator is given a minimum price below the known and quoted level, just so long will other fabricators move heaven and earth to locate a mill which will place them in equal competition; and they will succeed. This is what breaks the market. Stabilization of prices can come immediately if the pressure is removed from the fabricator by giving him the assured knowledge that he and his competition are upon exactly the same basis with respect to his costs for steel.

*R. H.*

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*Editor, The Iron Age:*

The note of warning under the heading of "Stop, Look, Etc.," in the Feb. 16 issue of your publication, we trust will be of some avail. Similar words of caution have been expressed by many others, from time to time, but the ruinous and destructive practices that have been in effect for these many years still continue.

The fact that your message is directed to producer as well as the consumer (fabricator) is evidence that you are thoroughly familiar with the critical condition of both industries. To one who has observed this unhealthy state of things, and who is interested as consumer (fabricator), it would be most welcome to have some substantial corrective measures brought about that would elevate the industry from the low plane to which it has fallen.

There are, of course, a good many customs and practices of long standing "not considered by some as unfair" to which the troubles of the industry can in a large measure be attributed and it is to only a few of these that we wish to refer:

The unrestricted capacity of the subsidiary fabricating plants of the mills for the fabrication of steel work.

The small tonnage involved in some of the inquiries on which these subsidiary plants quote is an indication of their entire disregard for the interests of the smaller fabricator.

The practice of making stock deliveries from mill at mill prices.

The preferences shown to some by quoting special prices not based on the desirability of the account from the point of security or the promptness with which the obligation for materials purchased is met, but entirely because of the volume or tonnage of orders placed by such parties, even though the hazard or risk in their acceptance might be very great.

The above practices after continual operation for a long time have made themselves felt detrimentally in the following ways:

The excessive capacity of the subsidiary shops for fabrication and the unquestioned advantages of such plants on account of their subsidiary connection with the mills prove a positive hardship on the larger independent fabricators. There should be some restrictions or limitations in this direction, so as to improve the condition of such larger independents.

The result of this would seem to be that these concerns, in turn, would be less apt to encroach on the field of business for the shops of smaller capacities. Then, again, it would enable the still smaller shops whose business is more or less of an emergency nature, to operate on the basis of taking a considerable part of their requirements from their own stock or from warehouse sources.

This, on the other hand, would more than likely have the effect of inducing the warehouses to keep from fabricating—a venture, on their part, made necessary by the stock shipments from mills at mill prices to such trade that the warehouse hitherto supplied.

To correct this latter condition, nothing more would be needed than for the mills to designate a minimum tonnage under an order that would only be recognized as a "mill order."

Aside from all of the above it would create a flow of what we should think would be highly desirable business for the mills in the way of stock-length orders, certainly preferable to orders cut to specifications.

In the matter of special prices on both plain and fabricated materials to preferred customers, it is our view that the mills' experience from such past practices has not been of the best, and here too it would be well for them to give due consideration.

The natural sequence of things as above explained can end in no manner other than utter ruin and disaster, as so clearly set out in your article, unless the policy being pursued at present is corrected.

*L. F. W.*

# • • EDITORIAL COMMENT • •

## The President Calls a Spade a Spade

IN his inaugural address the new President of the United States made a pronouncement of policy that was timely, candid and courageous. With a boldness of word that inspires hope for equal boldness of action he expressed what has been in the minds of inarticulate millions:

"There must be an end to a conduct in banking and in business which too often has given a sacred trust the likeness of callous and selfish wrongdoing."

Such a fearless utterance is heartening, especially in view of the manner in which recent disclosures in Washington have been minimized or, worse still, actually condoned in a large section of the public press. But the time for plain speaking has come. Operations on a scale that make those of Capone look insignificant are not to be ignored merely because they may prove to have been "within the law." The American people have lost patience with technical distinctions that are not differences in fact. They have lost patience with those who protest loudly against governmental waste, gangster racketeering and "unbalanced" prices and wage rates and remain silent regarding a far greater evil. They have become nauseated by formulas for restoring confidence from the lips of those who did the most to destroy confidence. And they did not need to be told that confidence languishes because "it thrives only on honesty, on honor, on the sacredness of obligations, on faithful protection, on unselfish performance," but they thank God that President Roosevelt said it.

Finance and business do not exist for immediate profit alone; they do not exist to enrich the powerful and impoverish the weak. Finance and business can thrive only when they seek the enduring profit that comes from dealings that promote the welfare of all. No credit system can be sound, no currency can be sound, no democracy can be sound unless finance and business are sound in the largest sense. A national leader who has emblazoned this truth on his banner has won the good will of all Americans who have not become callous and sordid. May action follow the word. May a resolute house cleaning, where house cleaning is most needed, restore an atmosphere where confidence can live and prosperity can enter.

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## Commendable Receivership Ruling

IN laying down the terms under which the Willys-Overland Co., now in receivership, may resume manfacture, Federal Judge George P. Hahn at Toledo has stipulated that there shall be no decrease from the wages which prevailed before the receivers were appointed.

For this ruling Judge Hahn deserves commendation. He has done what all industrialists should do who wish to stem the tide of wage reductions which are further lowering the purchasing power of the masses and thereby further depressing industry. In too many cases wages are below the subsistence level. The man or woman who receives a mere pittance for a week's work, due in considerable measure to the stupid and senseless price cutting in many industries, is a fit subject for communistic and other radical doctrines.

The best safeguard of our American institutions against infiltration of ideas destructive of our democratic system is payment of a living wage, a wage sufficient that workmen can buy proper food and clothing and can pay for adequate shelter for their families. The best safeguard of our present industrial system is recognition of that same fact by our industrial leaders. Would that there were more far-sighted executives like P. K. Wrigley, who recently raised wages of his employees, despite a shortening of their hours of work, declaring that this is the only logical way to put the masses again into a position where they can buy what industry is able to produce.

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## "Putting First Things First"

THE thread of realism that passed through President Roosevelt's entire inaugural address was nowhere more evident than in the portion devoted to international trade problems.

"Our international trade relations, although vastly important, are in point of time and necessity secondary to the establishment of a sound national economy," he said. "I favor as a practical policy the putting of first things first. I shall spare no effort to restore world trade by international economic readjustment, but the emergency at home cannot wait on that accomplishment."

Obviously the banking crisis will command the President's first attention. But no remedy for the banking crisis can be made lasting which does not protect American industry from the undermining influence of sinking world values. If the gold embargo is made permanent, the depreciation of the dollar in international marts may, for a time, offset the effects of competition from other depreciated currency countries. But temporary relief from cut-throat international competition should not blind us to the possibility of its reappearance in more accentuated form. Domestic economy cannot recover except on a firm foundation of values. And domestic business cannot be permitted to languish pending the conclusion of international negotiations that may be long drawn out and inconclusive in the end.

In announcing that he will put first things first, the new President no doubt realizes that the ideology of a political party that originated in a country that was predominantly agricultural must be modified to meet the needs of a nation that has become preponderantly industrial. It is to be hoped that he is aware that the first essential of recovery, not alone for the United States but for other nations, is to make it possible for American industry to regain its place as the world's largest consumer of materials. The extent to which our country normally surpasses other nations in consumption of industrial raw materials is brought out in the leading article in this issue of THE IRON AGE.

# Pig Iron Daily Output Up 7.8 Per Cent in February

PRODUCTION of coke pig iron in February totaled 554,330 gross tons, compared with the January figure of 568,785 tons. The February daily rate of 19,798 tons went up 7.8 per cent from the January rate of 18,348 tons daily.

There were 45 furnaces in blast on March 1, making iron at the rate of 18,910 tons daily, compared with the same number of active units on Feb. 1, but with a daily operating rate of 18,820 tons. Furnace changes during the month were few. Four furnaces were blown in and four blown out or banked. The Steel Corporation took off one unit. Independent steel companies put two furnaces in and two out, and merchant companies added two furnaces and put one out.

Among the units placed in operation are: Betty, of the Republic Steel Corpn.; Portsmouth, of the Wheeling Steel Corpn.; Sheridan, of the Lavino Furnace Co., and one Woodward Iron Co. furnace. Furnaces blown out or banked include: Ashland, of the American Rolling Mill Co.; one Ohio, of the Carnegie Steel Co.; one Shenango, of the Shenango Furnace Co., and City No. 2, of the Sloss-Sheffield Steel & Iron Co.

### Production of Coke Pig Iron and Ferromanganese

*Gross Tons*

| | Pig Iron* | | Ferromanganese† | |
|---|---|---|---|---|
| | 1933 | 1932 | 1933 | 1932 |
| January | 568,785 | 972,784 | 8,810 | 11,250 |
| February | 554,330 | 964,280 | 8,591 | 4,010 |
| March | ..... | 967,235 | ..... | 4,900 |
| April | ..... | 852,897 | ..... | 481 |
| May | ..... | 783,554 | ..... | 5,219 |
| June | ..... | 628,064 | ..... | 7,702 |
| ½ year | ..... | 5,168,814 | ..... | 33,562 |
| July | ..... | 572,296 | ..... | 2,299 |
| August | ..... | 530,576 | ..... | 3,414 |
| September | ..... | 592,589 | ..... | 2,212 |
| 9 months | ..... | 6,864,275 | ..... | 41,487 |
| October | ..... | 644,808 | ..... | 2,302 |
| November | ..... | 631,280 | ..... | 5,746 |
| December | ..... | 546,080 | ..... | 7,807 |
| Year | ..... | 8,686,443 | ..... | 57,342 |

*These totals do not include charcoal pig iron. The 1931 production of this iron was 46,213 gross tons.
†Included in pig iron figures.

### Production by Districts and Coke Furnaces in Blast

| Furnaces | Production (Gross Tons) February (28 Days) | Production (Gross Tons) January (31 Days) | March 1 Number in Blast | March 1 Operating Rate, Tons a Day | Feb. 1 Number in Blast | Feb. 1 Operating Rate, Tons a Day |
|---|---|---|---|---|---|---|
| *New York:* | | | | | | |
| Buffalo | 14,877 | 16,735 | 1 | 530 | 1 | 540 |
| Other New York | .... | .... | 0 | .... | 0 | .... |
| *Pennsylvania:* | | | | | | |
| Lehigh Valley | 18,598 | 15,488 | 2 | 640 | 2 | 500 |
| Schuylkill Valley | 12,339 | 12,588 | 1 | 440 | 1 | 405 |
| Susquehanna and Lebanon Valleys | 1,306 | .... | 0 | .... | 0 | .... |
| Ferro. and Spiegel | 1,191 | .... | 1 | 90 | 0 | .... |
| Pittsburgh District | 72,954 | 77,399 | 7 | 2,605 | *6 | *2,495 |
| Ferro. and Spiegel | 2,132 | 7,751 | 1 | 75 | 2 | 250 |
| Shenango Valley | 14,922 | 16,727 | 1 | 310 | 2 | 680 |
| Western Pa. | 12,495 | 14,936 | 1 | 445 | 1 | 480 |
| Ferro. and Spiegel | 5,394 | 6,200 | 1 | 190 | 1 | 200 |
| Maryland | 25,598 | 31,538 | 2 | 915 | 2 | 1,015 |
| Wheeling District | 64,104 | 76,646 | 4 | 2,290 | 4 | 2,470 |
| *Ohio:* | | | | | | |
| Mahoning Valley | 52,208 | 51,003 | 3 | 1,305 | 4 | 1,645 |
| Central and Northern | 79,953 | 79,239 | 6 | 2,940 | 5 | 2,555 |
| Southern | 13,651 | 8,351 | 2 | 715 | 1 | 270 |
| Illinois and Indiana | 100,833 | 103,621 | 7 | 3,600 | 7 | 3,340 |
| Mich., Wis. and Minn. | 12,055 | 13,758 | 1 | 430 | 1 | 445 |
| Colo., Mo. and Utah | 13,066 | 4,427 | 2 | 465 | 2 | 490 |
| *The South:* | | | | | | |
| Virginia | .... | .... | 0 | .... | 0 | .... |
| Kentucky | 7,172 | 8,432 | 0 | .... | 1 | 270 |
| Alabama | 29,582 | 23,946 | 2 | 935 | 2 | 770 |
| Ferromanganese | .... | .... | 0 | .... | 0 | .... |
| Tennessee | .... | .... | 0 | .... | 0 | .... |
| Total | 554,330 | 568,785 | 45 | 18,910 | *45 | 18,820 |

*Revised. Monessen furnace of Pittsburgh Steel Co. did not go in as scheduled.

### Daily Average Production of Coke Pig Iron

*Gross Tons*

| | 1933 | 1932 | 1931 |
|---|---|---|---|
| January | 18,348 | 31,380 | 55,299 |
| February | 19,798 | 33,251 | 60,950 |
| March | ..... | 31,201 | 65,556 |
| April | ..... | 28,430 | 67,317 |
| May | ..... | 25,276 | 64,325 |
| June | ..... | 20,935 | 54,621 |
| ½ year | ..... | 28,412 | 61,356 |
| July | ..... | 18,461 | 47,201 |
| August | ..... | 17,115 | 41,308 |
| September | ..... | 19,753 | 38,964 |
| October | ..... | 20,800 | 37,848 |
| November | ..... | 21,042 | 36,782 |
| December | ..... | 17,615 | 31,625 |
| Year | ..... | 23,733 | 50,069 |

### Merchant Iron Made, Daily Rate

| 1933 | *Tons* | 1932 | *Tons* |
|---|---|---|---|
| January | 2,602 | January | 6,256 |
| February | 2,863 | February | 7,251 |
| March | .... | March | 7,157 |
| April | .... | April | 5,287 |
| May | .... | May | 4,658 |
| June | .... | June | 6,090 |
| July | .... | July | 3,329 |
| August | .... | August | 3,070 |
| September | .... | September | 3,213 |
| October | .... | October | 4,286 |
| November | .... | November | 4,435 |
| December | .... | December | 3,674 |

## Rustless Iron Corpn. Wins Patent Suit

Judge William C. Coleman of the United States District Court at Baltimore on March 1 rendered a decision against the American Stainless Steel Co., Pittsburgh, and the Electro Metallurgical Co., New York, in their suit against the Rustless Iron Corpn. of America for alleged infringement of patents.

The suit was filed in May, 1929, on certain patents owned by American Stainless Steel Co. The Electro Metallurgical Co. was subsequently brought in as an additional party plaintiff. In his decision Judge Coleman declared that certain claims of the patents in suit are invalid.

The process alleged by the American Stainless Steel Co. to constitute an infringement of its patents is one in which chromium is introduced into the steel directly from chromium-bearing ore, as distinguished from the commonly practiced method of introducing the chromium in the form of an alloy of iron and chromium.

It is understood that an appeal will be filed.

# SUMMARY OF THE WEEK'S BUSINESS

# Bank Holiday Halts Steel Buying; Production Down to 15 Per Cent

## Inability of Consumers to Get Cash for Payrolls and Freight Charges Brings Some Suspensions—Steel Trade Hopeful As to Aftermath

THE country-wide bank holiday has had a marked effect on the volume of steel business and production. Ingot output has declined to a national average of 15 per cent from 17 per cent last week. but business has been so abruptly interrupted that mills are rolling mainly on orders placed a week or so ago, indicating a further contraction in operations unless an emergency banking system is speedily placed in effect.

One of the chief obstacles to the placing of steel orders is the inability of buyers to finance freight charges, but this may be overcome within a few days if the railroads agree to accept scrip. Some metal-working plants have closed down because of lack of funds with which to meet payrolls and other obligations. From such sources there have been suspensions of steel orders. The automobile industry has also held up considerable tonnage, but in the main consumers are taking steel that is ready for shipment, most of which is for work in process in their shops.

Despite the drastic character of the President's bank proclamation, there is a feeling of reassurance in the iron and steel trade and a belief that, once an emergency banking system has been established, business will proceed with greater acceleration than has been in evidence thus far in the year. Although the outcome of the present interregnum cannot be fully foreseen, there are expectations that some form of inflation will occur which will give a breathing spell to those whose businesses have suffered greatly because of ruinously low prices. The automobile industry is of the opinion that its sales will increase because of a widespread desire to spend the scrip that will be issued rather than hold it.

ALTHOUGH foreign exchange markets are suspended, with consequent stoppage of nearly all negotiations for steel to be exported or imported, the Japanese have inquired for 1000 tons of tin plate and 500 tons or more of tin plate wasters for prompt shipment, presumably having acquired American dollars prior to the bank closing.

AUTOMOBILE production has been sharply reduced by the bank holiday, and plans for the immediate future hinge largely on the ability of dealers to finance the purchase of cars, which are usually paid for in cash as they leave the factory. One of the smaller automobile companies has entirely suspended work, but others are continuing on restricted schedules, an exception being the Ford Motor Co., whose output of 1000 cars a day five days a week has thus far been continued. The Chevrolet Motor Co., whose orders have been the mainstay of business for some steel companies, has suspended a considerable tonnage that was to have been shipped this week.

The taking of bids on construction work has been postponed in a number of instances because bidders cannot furnish the required certified checks. Fabricated structural steel lettings in the week dropped to 10,250 tons, about half the total of the preceding week, while new projects calling for 1600 tons are the smallest since the first week of January. Application has been made by a group of New York promoters to the Reconstruction Finance Corporation for a loan of $100,000,000 for initial work on a bridge across the Hudson River at Fifty-seventh Street, New York, to accommodate railroad and highway travel. Approval of the plans is expected shortly from the War Department. The bridge will require about 360,000 tons of steel, or double that taken by the George Washington bridge and will require five years to build, giving employment to more than 20,000 men.

ANNOUNCEMENT of sheet prices for the second quarter by the American Sheet & Tin Plate Co. has been followed by adoption by other companies of the same prices, which are $1 a ton higher on some grades, but on No. 10 hot-rolled sheets the new quotation is $1 a ton below recently published quotations. New extras for gage and width have been put into effect on hot-rolled sheets. Because of the strengthening of sheet prices, makers of other products that have been affected by weakness are encouraged to stiffen their quotations, but the main influence at the moment is the expectation that all commodity prices may develop a stronger tone under inflationary money conditions. In the non-ferrous metal markets sales for future delivery are not being encouraged because of the uncertainty as to the outcome of the present situation upon prices. Scrap markets preserve a firm tone notwithstanding the almost complete stoppage of buying.

THERE were gains in production of pig iron and steel ingots in February, amounting to 7.8 per cent over January for pig iron and 14.7 per cent for ingots. The daily rate of pig iron production last month was 19,798 gross tons against 18,348 tons in January, although there was no increase in the number of furnaces in blast. Forty-five were in service on March 1, the same number as on Feb. 1. Steel ingot production last month, on a daily basis, was the largest since April, 1932, and, at 20.39 per cent of rated capacity, was above the average for all of last year.

# ▲▲▲ A Comparison of Prices ▲▲▲

**Market Prices at Date, and One Week, One Month and One Year Previous**
**Advances Over Past Week in Heavy Type, Declines in Italics**

| Pig Iron | Mar. 7, 1933 | Feb. 28, 1933 | Feb. 7, 1933 | Mar. 8, 1932 |
|---|---|---|---|---|
| *Per Gross Ton:* | | | | |
| No. 2 fdy., Philadelphia | $13.34 | $13.34 | $13.34 | $15.64 |
| No. 2, Valley furnace | 14.50 | 14.50 | 14.50 | 15.00 |
| No. 2 Southern, Cin'ti | 13.82 | 13.82 | 13.82 | 13.82 |
| No. 2, Birmingham | 11.00 | 11.00 | 11.00 | 11.00 |
| No. 2 foundry, Chicago* | 15.50 | 15.50 | 15.50 | 16.50 |
| Basic, del'd eastern Pa. | 13.50 | 13.50 | 13.50 | 16.00 |
| Basic, Valley furnace | 13.50 | 13.50 | 13.50 | 14.50 |
| Valley Bessemer, del'd P'gh. | 16.89 | 16.89 | 16.89 | 17.39 |
| Malleable, Chicago* | 15.50 | 15.50 | 15.50 | 16.50 |
| Malleable, Valley | 14.50 | 14.50 | 14.50 | 15.50 |
| L. S. charcoal, Chicago | 23.17 | 23.17 | 23.17 | 23.17 |
| Ferromanganese, seab'd carlots | †68.00 | 68.00 | 68.00 | 75.00 |

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

†Contract price; spot quotation $61.

| Rails, Billets, etc. | | | | |
|---|---|---|---|---|
| *Per Gross Ton:* | | | | |
| Rails, heavy, at mill | $40.00 | $40.00 | $40.00 | $43.00 |
| Light rails at mill | 30.00 | 30.00 | 30.00 | 34.00 |
| Rerolling billets, Pittsburgh | 26.00 | 26.00 | 26.00 | 27.00 |
| Sheet bars, Pittsburgh | 26.00 | 26.00 | 26.00 | 26.00 |
| Slabs, Pittsburgh | 26.00 | 26.00 | 26.00 | 27.00 |
| Forging billets, Pittsburgh | 31.00 | 31.00 | 31.00 | 33.00 |
| Wire rods, Pittsburgh | 35.00 | 35.00 | 35.00 | 37.00 |
| | Cents | Cents | Cents | Cents |
| Skelp, grvd. steel, P'gh, lb. | 1.60 | 1.60 | 1.60 | 1.50 |

| Finished Steel | | | | |
|---|---|---|---|---|
| *Per Lb. to Large Buyers:* | Cents | Cents | Cents | Cents |
| Bars, Pittsburgh | 1.60 | 1.60 | 1.60 | 1.50 |
| Bars, Chicago | 1.70 | 1.70 | 1.70 | 1.70 |
| Bars, Cleveland | 1.65 | 1.65 | 1.65 | 1.65 |
| Bars, New York | 1.95 | 1.95 | 1.95 | 1.85 |
| Tank plates, Pittsburgh | 1.60 | 1.60 | 1.60 | 1.50 |
| Tank plates, Chicago | 1.70 | 1.70 | 1.70 | 1.70 |
| Tank plates, New York | 1.648 | 1.698 | 1.698 | 1.798 |
| Structural shapes, Pittsburgh | 1.60 | 1.60 | 1.60 | 1.50 |
| Structural shapes, Chicago | 1.70 | 1.70 | 1.70 | 1.70 |
| Structural shapes, New York | 1.86775 | 1.86775 | 1.86775 | 1.76775 |
| Cold-finished bars, Pittsburgh | 1.70 | 1.70 | 1.70 | 2.00 |
| Hot-rolled strips, Pittsburgh | 1.45 | 1.45 | 1.45 | 1.40 |
| Cold-rolled strips, Pittsburgh | 1.80 | 1.80 | 1.80 | 1.90 |

| Finished Steel | Mar. 7, 1933 | Feb. 28, 1933 | Feb. 7, 1933 | Mar. 8, 1932 |
|---|---|---|---|---|
| *Per Lb. to Large Buyers:* | Cents | Cents | Cents | Cents |
| Hot-rolled annealed sheets, No. 24, Pittsburgh | 2.00 | 2.00 | 2.00 | 2.20 |
| Hot-rolled annealed sheets, No. 24, Chicago dist. mill | 2.10 | 2.00 | 2.00 | 2.30 |
| Sheets, galv., No. 24, P'gh | 2.60 | 2.50 | 2.50 | 2.85 |
| Sheets, galv., No. 24, Chicago dist. mill | 2.70 | 2.50 | 2.60 | 2.95 |
| Hot-rolled sheets, No. 10, P'gh | 1.40 | 1.45 | 1.45 | 1.55 |
| Hot-rolled sheets, No. 10, Chicago dist. mill | 1.50 | 1.55 | 1.55 | 1.65 |
| Wire nails, Pittsburgh | 1.85 | 1.85 | 1.80 | 1.95 |
| Wire nails, Chicago dist. mill | 1.90 | 1.90 | 1.85 | 2.00 |
| Plain wire, Pittsburgh | 2.10 | 2.10 | 2.10 | 2.20 |
| Plain wire, Chicago dist. mill. | 2.15 | 2.15 | 2.15 | 2.25 |
| Barbed wire, galv., Pittsburgh | 2.35 | 2.35 | 2.30 | 2.60 |
| Barbed wire, galv., Chicago dist. mill | 2.40 | 2.40 | 2.35 | 2.65 |
| Tin plate, 100 lb. box, P'gh. | $4.25 | $4.25 | $4.25 | $4.75 |

| Old Material | | | | |
|---|---|---|---|---|
| *Per Gross Ton:* | | | | |
| Heavy melting steel, P'gh | $8.50 | $8.50 | $8.50 | $10.25 |
| Heavy melting steel, Phila. | 6.75 | 6.75 | 6.75 | 7.37½ |
| Heavy melting steel, Ch'go. | 5.25 | 5.25 | 5.25 | 7.12½ |
| Carwheels, Chicago | 8.00 | 8.00 | 7.50 | 7.25 |
| Carwheels, Philadelphia | 8.00 | 8.00 | 8.00 | 10.50 |
| No. 1 cast, Pittsburgh | 9.00 | 9.00 | 9.00 | 9.75 |
| No. 1 cast, Philadelphia | 8.00 | 8.00 | 8.00 | 10.00 |
| No. 1 cast, Ch'go (net ton) | 6.25 | 6.25 | 6.25 | 7.50 |
| No. 1 RR. wrot., Phila | 7.50 | 7.50 | 7.50 | 8.50 |
| No. 1 RR. wrot., Ch'go (net) | 4.50 | 4.50 | 4.50 | 6.50 |

| Coke, Connellsville | | | | |
|---|---|---|---|---|
| *Per Net Ton at Oven:* | | | | |
| Furnace coke, prompt | $1.75 | $1.75 | $1.75 | $2.25 |
| Foundry coke, prompt | 2.50 | 2.50 | 2.50 | 3.50 |

| Metals | | | | |
|---|---|---|---|---|
| *Per Lb. to Large Buyers:* | Cents | Cents | Cents | Cents |
| Lake copper, New York | 5.00 | 4.75 | 5.00 | 6.50 |
| Electrolytic copper, refinery | 4.75 | 5.00 | 4.75 | 6.25 |
| Tin (Straits), New York | .... | 23.20 | 23.70 | 22.10 |
| Zinc, East St. Louis | .... | 2.67½ | 2.75 | 2.80 |
| Zinc, New York | .... | 3.04½ | 3.12 | 3.17 |
| Lead, St. Louis | 2.87½ | 2.87½ | 2.87½ | 3.05 |
| Lead, New York | 3.00 | 3.00 | 3.00 | 3.30 |
| Antimony (Asiatic), N. Y. | 5.62½ | 5.62½ | 5.75 | 6.25 |

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

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# ▲▲▲ The Iron Age Composite Prices ▲▲▲

| | Finished Steel | Pig Iron | Steel Scrap |
|---|---|---|---|
| March 7, 1933 | 1.923c. a Lb. | $13.56 a Gross Ton | $6.83 a Gross Ton |
| One week ago | 1.923c. | 13.56 | 6.83 |
| One month ago | 1.923c. | 13.56 | 6.83 |
| One year ago | 1.933c. | 14.47 | 8.25 |
| | Based on steel bars, beams, tank plates, wire rails, black pipe, sheets and hot rolled strip. These products make 85 per cent of the United States output. | Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham. | Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago. |

| | Finished Steel | | Pig Iron | | Steel Scrap | |
|---|---|---|---|---|---|---|
| | High | Low | High | Low | High | Low |
| 1932 | 1.977c., Oct. 4 | 1.926c., Feb. 2 | $14.81, Jan. 5 | $13.56, Dec. 6 | $8.50, Jan. 12 | $6.42, July 5 |
| 1931 | 2.037c., Jan. 13 | 1.945c., Dec. 29 | 15.90, Jan. 6 | 14.79, Dec. 15 | 11.33, Jan. 6 | 8.50, Dec. 29 |
| 1930 | 2.273c., Jan. 7 | 2.018c., Dec. 9 | 18.21, Jan. 7 | 15.90, Dec. 16 | 15.00, Feb. 18 | 11.25, Dec. 9 |
| 1929 | 2.317c., April 2 | 2.273c., Oct. 29 | 18.71, May 14 | 18.21, Dec. 17 | 17.58, Jan. 29 | 14.08, Dec. 3 |
| 1928 | 2.286c., Dec. 11 | 2.217c., July 17 | 18.59, Nov. 27 | 17.04, July 24 | 16.50, Dec. 31 | 13.08, July 2 |
| 1927 | 2.402c., Jan. 4 | 2.212c., Nov. 1 | 19.71, Jan. 4 | 17.54, Nov. 1 | 15.25, Jan. 11 | 13.08, Nov. 22 |

# Pittsburgh and Wheeling Steel Output Off; Valleys Gain

## Situation Influenced by Bank Holiday—Second Quarter Sheet Prices Announced—Tin Mill Schedules Down Considerably

PITTSBURGH, March 7. — In spite of a rather sharp curtailment in new orders, local steel companies are continuing production in most instances with only minor downward revisions in operating schedules. Customers are being encouraged to continue releases of finished steel products despite difficulties in financing transactions. The larger steel companies are doing their best to meet their payrolls and take care of employees through the banking holiday.

Steel ingot production in the Pittsburgh district will not average less than 13 per cent during the week according to present plans, and in the Valleys an advance of two points is indicated because of resumption of production by a large plant which has been inactive. Steel production in the Wheeling territory has declined to 25 per cent because of sharp curtailment on the part of one large plant.

Finishing mill schedules are off a little on most all products, sheets and strips being affected most severely because of curtailed automotive releases. Tin mill schedules are also down considerably.

Announcement of minimum sheet quotations by the leading producer has had a generally beneficial effect upon the entire finished steel price structure. It is understood that these figures will apply on second quarter contracts, but producers have made it clear that advances might be made immediately if inflationary measures are undertaken by the Government. Consumers, however, are not interested in forward buying at this time and are possibly more inclined toward caution than producers.

Buying of raw materials by steel makers has been temporarily halted, and pig iron purchases by the foundries are almost entirely lacking.

### Pig Iron

Shipments are at a minimum and new orders have been lacking in the last few days. The Neville Island, Pittsburgh, furnace of the Davison Coke & Iron Co. has been banked.

### Semi-Finished Steel

With the announcement of second quarter quotations on sheets and hot-rolled strip steel, sellers of billets, slabs and sheet bars have indicated that the current price of $26, Pittsburgh or Youngstown, will be unchanged for that period. Forging billets are well maintained at $31, Pittsburgh. Makers of wire rods have opened their books for the next quarter at the recent price of $35, Pittsburgh or Cleveland.

### Rails and Track Accessories

The market continues quiet in this district, although several of the carriers are expected to inquire for their second quarter miscellaneous steel requirements in the next week or two. Railroad spikes have been reduced $5 a ton to 2.15c., a lb., Pittsburgh. Prices on other track supplies are unchanged.

### Bolts, Nuts and Rivets

Orders have tapered off and specifications are extremely light. Current discounts are expected to be reaffirmed for second quarter.

### Bars, Plates and Shapes

Structural awards were slightly heavier last week, as financial difficulties have not interfered with the placing of Federal and State jobs. A fair amount of railroad work has also been booked. New inquiries are lighter. Shipments of both structural steel and reinforcing bars on old contracts have not been curtailed. Plates are quiet, although a little business is coming from the oil industry. A Wheeling, W. Va., coal company has ordered three barges, requiring 470 tons of plates. Demand for merchant bars has fallen off sharply and alloy material has been similarly affected.

Although mills have not opened their books for second quarter, no change is contemplated in the 1.60c., Pittsburgh quotation on bars, plates and shapes. Establishment of 1.40c., Pittsburgh, price on reinforcing bars in mill lengths is bringing a semblance of stability to that market.

### Cold-Finished Steel Bars

Specifications have declined sharply in the last week, reflecting, to a large extent, a holding up of shipments to the automobile industry. The price is well maintained and will probably be reaffirmed for second quarter.

### Tubular Goods

One maker of oil country goods reports a slight improvement in tonnage since the beginning of the month. However, general demand for pipe is lighter and production schedules this week are sharply curtailed. No new line pipe projects have appeared, but mills are looking for some business from this source in the next month or two.

### Wire Products

Seasonal improvement in demand for merchant wire products has been checked and the market is very quiet. Specifications for manufacturers' wire have also fallen off, reflecting uncertainty on the part of consumers. The recently announced prices of 2.10c., Pittsburgh, on manufacturers' wire and $1.85 a keg on nails will be continued into the second quarter.

### Sheets

Announcement of minimum prices on sheet mills products by the leading maker last week has met with favorable response in the trade, and independent producers have generally adopted the quotations. The price of 1.40c., Pittsburgh, on hot-rolled sheets, No. 10 gage, represents a $1 a ton decline from recent quotations, but the other figures are generally higher than recent selling levels. Galvanized sheets are now quoted at 2.60c., Pittsburgh; hot-rolled annealed, No. 24 gage, at 2c.; cold-rolled No. 10 gage, 1.90c.; cold-rolled No. 20 gage, 2.30c., and long ternes, No. 24, gage, unassorted at 2.75c. On No. 17 gage and lighter the same length and width extras now apply to both hot and cold-rolled sheets. Unassorted cold-rolled sheets, that is without surface inspection, will be 15c. per 100 lb. below base prices. While the new prices naturally will not apply to contracts for shipment during the remainder of the quarter, full adherence to the new schedules is expected by the end of the month. In the meantime, they are being applied rigidly on new business. Demand has declined rather sharply in the last few days and operating schedules this week may not average more than 15 per cent of capacity.

### Tin Plate

Specifications have been curtailed in the last week, and production has declined to about 35 per cent of capacity. Shipments to the larger container makers have not been affected by the bank moratorium.

### Strip Steel

Hold-ups by the large automotive consumers have seriously curtailed strip tonnage. Production schedules have been revised downward and some mills will not operate this week. The 1.45c., Pittsburgh, price on hot-rolled strip is being reaffirmed for second quarter but no action has been taken on cold-rolled. The market continues to be quotable at a wide range.

### Coke and Coal

The market shows little change, although consumers are beginning to curtail shipments. Large producers of coal are experiencing difficulties with customers who are unable to finance freight charges.

### Scrap

Despite absence of consumer buying and hold-ups at one or two shipping points, the scrap market has retained its recent strength. Bidding on the railroad lists brought out higher figures than was the case one month ago, but the Pennsylvania is reported not

to have sold the heavy melting steel on its list. The Baltimore & Ohio steel brought better than $9.25. Dealers are still able to pick up occasional cars of No. 1 steel at as low as $8, but the best grade of railroad material seems to be worth as much as $9.50 at one point. A small sale of No. 2 steel at $7.50 is reported. The other grades are unchanged.

# British Pig Iron Demand Gaining; Continental Steel Business Poor

LONDON, ENGLAND, March 6 (*By Cable*).—Domestic demand for pig iron is increasing and more furnaces are to be started. Export sales are still negligible.

South Africa has bought 17,000 tons of British rails and fish plates. Other steel buyers are specifying more freely. The tin plate market is quiet, but export demand is expected to revive on improvement in sterling. Present output is at about 70 per cent of capacity.

Continental steel demand is poor and gold prices have eased because of the growing uncertainty as to the outcome of the Raw Steel Cartel and negotiations for sales syndicates under the cartel. Meetings of Continental syndicates for semi-finished steel, joists and plates will be held at Düsseldorf on March 7, at Paris on March 9, at Brussels on March 14 and at Luxemburg on March 20.

Continental Wire Rod Cartel has made no change in quotas or prices.

International Tube Cartel will meet in Paris shortly to discuss the plan for renewal.

Italy is selling tin plate to Japan in competition with Wales. One Italian works is arranging to increase its output.

**British Prices, f.o.b. United Kingdom Ports**

*Per Gross Ton*

| | | | |
|---|---|---|---|
| Ferromanganese, export | £9 | | |
| Billets, open-hearth | £5 | to £5 7s. | 6d |
| Black sheets, Japanese specifications | £11 | | |
| Tin plate, per base box | 15s. | 9d. to 16s. | |
| Steel bars, open-hearth | £7 17½s. | to £8 7½s. | |
| Beams, open-hrth. | £7 7½s. | to £7 17½s. | |
| Channels, open-hearth | £7 12½s. | to £8 2½s. | |
| Angles, open-hearth | £7 7½s. | to £7 17½s. | |
| Black sheets, No. 24 gage | £8 10s. | | |
| Galvanized sheets, No. 24 gage | £10 10s. | to £10 15s. | |

**Continental Prices, f.o.b. Continental Ports**

*Per Metric Ton, Gold £ at $4.86*

| | | | |
|---|---|---|---|
| Billets, Thomas | £2 2s. | | |
| Wire rods, No. 5 B.W.G. | £4 10s. | | |
| Black sheets, No. 31 gage, Japanese | £11 5s. | | |
| Steel bars, merchant | £2 8s. | to £2 10s. | |
| Beams, Thomas | £2 4s. | 6d. | |
| Angles, Thomas, 4-in. and larger | £2 7s. | | |
| Angles, small | £2 9s. | | |
| Hoops and strip steel over 6-in. base | £3 12s. | 6d. to £3 15s. | |
| Wire plain, No. 8. | £5 7s. | 6d. | |
| Wire nails | £5 15s. | | |
| Wire, barbed. 4-pt. No. 10 B.W.G. | £8 15s. | | |

# New England Pig Iron Sales Still Small

BOSTON, March 7.—Sales of pig iron to New England consumers are still small, those for the past week just topping 200 tons. There is little prospect of business until the banking situation is clearer, despite the fact that a slight increase in the New England weekly melt is noted. The increase is due to the reopening of the foundry of the Gilbert & Barker Mfg. Co., West Springfield, Mass., and the concentrating of work in other foundries. With the importation situation under fire, it is interesting to note that a small tonnage of low phosphorous domestic iron recently left this port for Germany.

The slight advance in No. 1 heavy melting steel prices in the Pittsburgh district is not reflected here. With a freight rate of $5.85 a ton from Boston to Pittsburgh, prices at Pittsburgh are still too low to attract New England sellers. Business so far as it relates to domestic deliveries is virtually at a standstill. Material for the steamer loading at Chelsea, Mass., for Danzig is arriving at dock more slowly than anticipated and it will be a day or two before the cargo is completed. Massachusetts closed bids yesterday for a small tonnage of scrap for the prison at Charlestown.

# Birmingham Pig Iron Market Sluggish

BIRMINGHAM, March 7.—The pig iron market is exceedingly restricted as to inquiries, bookings, shipments and prospects. Foundries are ordering only for immediate and important requirements. One local pipe manufacturer increased production last week and this week to complete tonnage on old bookings. Local pipe plants bid on about 4000 tons of pipe last week, but this tonnage is still pending. The pig iron price of $11 for the Southern market is holding. Furnace operations are the same as for several weeks, two furnaces being in blast. Woodward Iron has a furnace on foundry and the Tennessee company one on basic.

## Steel

Bookings have been light during the past two weeks, and the rate of middle February has not been maintained since. Current tonnage is made up of small, scattered orders. The market is largely dependent on current requirements, which are small in scope. There is a decline this week in open-hearth operations. Five are being worked, as compared with six and seven last week and seven for a month or more previous.

# San Francisco-Oakland Bridge Bids Taken

SAN FRANCISCO, March 6.—Bids have been received on the West Bay Sub-structure (contract No. 2) of the San Francisco-Oakland bridge. The Transbay Construction Co. has been announced as the low bidder at $6,957,100.68, approximately $2,000,000 less than the estimate of the engineers. The Transbay Construction Co. is a specially organized corporation of four companies of which three are members of the Six Companies, Inc., builder of the Hoover dam. The award on this unit, which calls for 1900 tons of reinforcing bars, 150 tons of structural steel, 225 tons of timber fastenings, will be made immediately after final bids on all units of the span are opened.

Owing to the bank holiday, bids were not taken on the East Bay substructure, scheduled for March 2, as it was impossible to post certified checks. Bids will be taken on the West Bay super-structure and cables on March 7, while bids on the San Francisco anchorage, the Yerba Buena Island crossing and the East Bay superstructure are scheduled to be taken the following day.

Although bids have been taken on the Federal Building in San Francisco, no award has been made. This project requires 700 tons of reinforcing bars and approximately 4500 tons of reinforcing steel.

Prices are reported to be weak on sheets, but there has as yet been no change of schedule.

Because of the Golden Gate bridge, San Francisco leads all other cities in the United States for January in the value of building permits, which were two-fifths of all permits reported throughout the country for January and nine-tenths of the total for San Francisco for the entire year 1932.

The Bank of America has just purchased a second block of $3,000,000 of the Golden Gate Bridge and Highway District bonds, thereby insuring that financial requirements for the bridge during the current year will be taken care of, according to directors.

# Chicago Business Seriously Affected by Bank Holiday

## Ingot Output Down to 13 Per Cent—Consumers' Inability to Pay Freight Charges an Obstacle to Buying

CHICAGO, March 7.—The bank holiday has checked steel business to the extent that ingot output in the Chicago area has dropped to 13 per cent of capacity, and producers expect the rate will be lower before the end of the week. During the first day or two of the holiday orders on hand gave reassuring support to rollings, but by Monday evening mills gave consideration to complete shutdown; however, they finally decided to roll the steel actually called for and await developments.

One of the obstacles has been the inability of many consumers to pay freight charges. The Interstate Commerce Commission and the railroads are acting to alleviate this condition. In the meantime, sellers of steel are taking the stand that when they extend credit for a steel order they are meeting their obligation to a customer and that the delivery of the steel is an obligation that the railroad must determine in its relations with its customer.

One immediate effect of the bank situation is the suggestion of the possibility of speculation in materials. For this reason one large sheet producer is withholding announcements of second quarter prices. Not only have new orders for iron and steel fallen in number, but some releases are being cancelled and there is a noticeable absence of commitments that sellers had expected would appear about this time. As a whole, the market is orderly while new appraisals are being put on credit.

### Pig Iron

Cancellations of releases for Northern foundry iron are causing little disturbance in the market. However, new inquiries have dropped rather sharply and business that dealers had expected to come out has gone into hiding for the time being. Sellers are somewhat less inclined to urge tonnages upon customers. They sense that users may want to trade their dollars for commodities and that speculation, not now apparent, may result in higher quotations.

### Cast Iron Pipe

The R. F. C. is now making a few loans which will result in pipe orders and dealers are distinctly encouraged. Chicago engineers are working on specifications for the new water plant, and work has finally started at Wilmette, Ill., where it has been decided to use 3000 ft. of steel pipe for the water works intake. Prices for the few small lots now moving are steady. A few attractive inquiries are needed to test the price structure.

### Reinforcing Bars

One after another, dealers are falling in line for higher prices. Quotations on rail steel reinforcing bars now are 1.45c. a lb. for lots of less than five tons each and 1.30c. for five tons or more. The billet steel commodity is priced at 1.70c. a lb. for less than five tons and 1.55c. for five tons or more. Inquiries remain very light and tests of prices are lacking. Brewery work in prospect is encouraging, but promotors are cautious, and definite requests for prices have not materialized.

### Bolts, Nuts and Rivets

Prices are unchanged and some contracts have been accepted by users. The general business situation is reflected in this market. An upturn in jobber demand has been abruptly halted.

### Wire Products

Producers are sending out prices for second quarter. Bright wire remains at 2.10c. a lb. and wire nails are unchanged at $1.85 a keg. Pittsburgh and Cleveland. Galvanized nails are raised to $3.35 a keg and woven wire fence remains at $50, base column. Wire producers, having been in the habit of prepaying freight, are not now confronted with the problem of lending this special assistance to customers who are handicapped by lack of banking facilities. Shipments are lighter, a reflection of the bank moratorium. Output, which had held up on old orders until the opening of the week, is gradually turning downward. Large manufacturing districts have been more quickly affected, in so far as consumption is concerned, than rural areas.

### Rails and Track Supplies

There is no hint of an open market inquiry for rails. Both of the Chicago mills are without orders for immediate rolling. On the other hand, there is still a fair movement of track supplies. Several attractive inquiries are out for light rails, one of these being for export to Hawaii. Sales in small lots are also more numerous. Large track spikes are now being quoted at $2.15 per 100 lbs.

### Structural Material

Awards, bolstered by the 5000 tons for the St. Paul post office, total over 6000 tons, but fresh inquiries are less than 2000 tons. Shops have schedules that are at the lowest point of the last 12 months. Some consideration is being given to higher prices, but so far no definite action has been taken. A 2000-ton bridge is in prospect at Omaha, Neb., but there is some doubt that the job will be undertaken at this time.

### Plates

A mill order for 2400 tons of plates for tanks to be erected in Texas is outstanding in a market that otherwise is very quiet. Some plates will be needed for sluice gates in Wisconsin, and here and there a municipality plans to erect a new water tank. Railroad shop use is very light.

### Bars

Orders on hand held bar shipments steady to the end of last week, but since that time the movement has been downward. This is a direct reflection of the bank holiday. Small and miscellaneous users have shown less tendency to drop their demand than have the larger consumers, such as automobile manufacturers. Some users, hard pressed for cash, are now asking mills to prepay the freight. Sellers are now scanning credits closer than ever and in most instances are hesitant to meet this new demand until they learn what action the railroads will take in extending credit.

### Sheets

Although sheet producers in this district are ready to announce prices for the second quarter, they are going slow in the matter in view of the new financial situation, the eventual result of which, it is believed, may be general price advances in all commodities. If such should prove to be the case, the sheet manufacturers would not want to stand committed at this early date to the prices that were to have been announced. The use of sheets by automobile manufacturers is lighter, but gains by roofers and general manufacturers have taken up part of the slack.

### Scrap

A small quantity of heavy melting steel has been taken by a mill at $5.50 a gross ton, delivered. Otherwise, the market is extremely dull. The flow of scrap to consumers is almost at a standstill. Scrap continues to move to local docks. Some of this is prepared and ready for movement by boat should prices and demand be favorable when navigation opens, but some of it is unprepared and yard operations are being carried on at the docks. The flow of malleable scrap, which has been accelerated for several weeks, is smaller under the spell of the bank holiday.

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The National Association of Flat-Rolled Steel Manufacturers has removed its headquarters from Cleveland to 565 Frick Annex Building, Pittsburgh.

# Eastern Pennsylvania Trade Hopeful Despite Stagnation

## Bank Moratorium Stifles Business, But Resumption on a More Active Scale is Expected to Follow Holiday

PHILADELPHIA, March 7.—Stagnated though it is by the nation-wide banking situation, the iron and steel trade in this district is looking forward with considerable confidence to a stimulation of activity after Congress meets Thursday and enacts legislation to meet the crisis. The swift action of the Roosevelt administration in bringing about a four-day moratorium and a gold embargo has received universal approval.

Although closing of banks, stopping withdrawals, and making checks non-negotiable has brought about a paralysis of business, it is realized that the drastic move was necessary and is only temporary. Salesmen have been forced to abandon the road; and orders have been extremely scant, with some shipments deferred, but these disturbances have been accepted with good grace, pending definite legislative action which it is hoped will be swift and certain for the purpose of releasing capital and renewing free exchange of goods.

Some are of the opinion that the much-discussed bottom in values has been reached at last and that an upturn both in prices and business is near at hand. It is realized that the country still has a rough road to travel and that temporarily business likely will be done extensively on a scrip basis, but the fact that the situation is being met with a firm hand has given assurance to business.

Generally the price structure remains unchanged, though plates continue to sag. While they are widely quoted at 1.50c. to 1.60c., Coatesville, large tonnages can be bought at less.

Operations have dropped one-half point to 10 per cent of steelworks capacity. A small shape mill was started today at Pencoyd, Pa., for several days' operations.

### Pig Iron

Even carlot business now has become infrequent. Like other branches of the trade, pig iron makers and consumers are marking time, pending developments after the banking holiday. A shipment of about 150 tons of German ferromanganese is due to arrive at this port at the end of the present week for stocking at South Chester, Pa. Makers are quoting $61, Atlantic seaboard for spot shipments.

### Sheets

The new price setup for the second quarter on sheets remains untested. Hot-rolled No. 10 gage is quoted at 1.40c., Pittsburgh, a cut of $1. No. 10 heavy cold-rolled is 1.90c., No. 20 light cold-rolled is 2.30c., and No. 24 hot-rolled annealed is 2c. Mill run sheets, not inspected, take a differential of 15c. per 100 lb., under the standard gage inspected sheets. Heretofore prices applied on heavy gage hot-rolled sheets, No. 10 base, included sheets 24 to 48 in. inclusive and also on No. 10 gage hot-rolled annealed sheets over 48 in. Now both are consolidated at 1.40c. Differentials also have been reduced on widths for cold-rolled sheets. Virginia will close bids March 10 on 165 to 215 tons of No. 24 gage one-pass cold-rolled sheets for 1934 automobile license tags.

### Plates, Shapes and Bars

Shapes continue to be quoted at 1.60c., Eastern mills, and merchant steel bars at 1.60c., Pittsburgh. Plates, however, show further weakness.

### Imports

The following iron and steel imports were received here last week: 3090 tons of pig iron from the Netherlands and 1657 tons from British India; 526 tons of manganese ore from the Dutch East Indies, 38 tons of steel bars, 25 tons of ferromanganese and 18 tons of steel bands from Germany and 21 tons of structural shapes from Belgium.

### Scrap

The market is dull and prices are unchanged.

# Valley Mills Affected by Drop in Automobile Industry's Orders

YOUNGSTOWN, March 7.—While Valley steel producers have naturally felt the slump in buying which has affected the entire industry in the last few days, February tonnage compared favorably with that of the preceding month. Releases during the first week of March have been extremely light, and shipments have been sharply curtailed.

Valley mills have felt most keenly the recent falling off in automotive orders, which had constituted a fairly large share of recent tonnage. Pipe releases show no marked change, and new inquiry is a little heavier. The approach of warmer weather promises the placing of some line pipe tonnage, although most of the sizable projects in this field are still delayed by lack of financing arrangements. Tin plate specifications are well maintained, and production in the Valleys is holding at better than 50 per cent of capacity. Sheet schedules are lighter, and strip production has fallen off even more sharply. Firming of prices on merchant wire products has brought out a little business, but miscellaneous orders for bars and plates are lighter.

Announcement of second quarter prices on sheets has given this market a much better tone, and Valley makers are holding strictly to the new quotations on new business. In most cases the new prices represent an advance over the levels at which the larger consumers had been able to buy, although little tonnage of ordinary hot-rolled sheet had been taken at less than 1.40c., Pittsburgh. The 1.45c., Pittsburgh, price on hot-rolled strip is being reaffirmed for the second quarter, but the market on cold-rolled strip is less clearly defined. While most buyers are paying 1.90c. to 2c. for this material, larger users are covered at much less, and the market has achieved no stability. Bars and plates are well held at 1.60c., Pittsburgh, and no reduction in the $26, Youngstown, price on billets, slabs and sheet bars is contemplated. In fact, producers are particularly anxious to hold this market, because of its influence in stabilizing sheet quotations.

The raw material market in the district is very quiet, with scarcely any sales of pig iron reported. Recent sales of scrap have indicated a rather strong market, with heavy melting steel quotable at $8 to $8.50, and hydraulic compressed sheets at 25c. less.

# Cincinnati Pig Iron Sales in Small Lots

CINCINNATI, March 7.—Sales of pig iron the past week totaled about 300 tons in single car orders. Inquiries for pig iron are small in quantity and number. Shipments during February fell off slightly.

### Scrap

Current dealings in old material are small and without market influence. Prices are unchanged, but nominal in the absence of test.

American Zinc Institute, Inc., 60 East Forty-second Street, New York, will hold its regular annual meeting in New York on April 18.

# Cleveland Steel Volume Lower; Operations at 20 Per Cent

## Banking Holiday Affects Business—Some Metal-Working Plants Closed Temporarily—Trade Is Optimistic

CLEVELAND, March 7.—With the unsettled financial situation, steel business has tapered to a very low volume. Some orders have been cancelled and deliveries on others has been held up, most of these being from automotive sources. Suspension of orders in many cases has been due to the tying up of buyers' funds. Producers have not changed their credit policy and any customer who had a satisfactory rating before the tying up of bank accounts may secure shipments of steel. A few metal-working plants, because of difficulty in securing funds to meet payrolls and other obligations, have shut down temporarily.

In spite of the present difficulties, considerable optimism is prevalent, many thinking that with the clearing up of the bank situation and with the enactment of whatever remedial legislation is regarded as advisable, industry will be in a better position to start on an upward trend.

Ingot output in Cleveland this week was further reduced three points to 20 per cent of capacity. The American Steel & Wire Co. and the Corrigan, McKinney Steel Co. each took off a furnace, but the Otis Steel Co. resumed operations of its steel plant with one open-hearth furnace. The American Steel & Wire Co. started up its Bessemer converter, which has been idle several weeks.

Important changes in the classification of sheets with a view of simplifying the price structure on hot-rolled sheets have been announced by some of the leading producers, who at the same time announced new prices. Hot-rolled and hot-rolled annealed sheets in the heavy gages have been combined under the one classification of No. 10 hot-rolled sheets, with a 1.40c. base price. New gage extras and new size extras for sheets Nos. 10 to 16 gage and for 48 in. and wider are provided. The change in the gage differential is the reduction of 5c. per 100 lb., No. 13 to No. 16 gage, inclusive. New width extras are also provided for box annealed hot-rolled sheets, cold-rolled sheets and vitreous enameling sheets in the light gages from No. 17 to No. 30. Some mills are contemplating a new classification of cold-rolled sheets carrying no guarantee for finish. The new base prices will apply on orders for delivery after March 31, and probably through the second quarter.

### Bars, Plates and Shapes

The bank holiday has interfered with public lettings in the structural field, as builders are unable to secure certified checks to file with bids. The Ohio letting schedule for March 10 has been postponed. New inquiry is lacking. Demand for steel bars has declined and some business has been held up. Prices are steady.

### Pig Iron

Little tonnage was sold the past week, and shipments declined. Demand from the motor car industry has fallen off, some of the consumers in that field not yet having issued releases for March. Producers have adopted a liberal attitude in the present financial situation and are willing to continue making shipments to consumers who have a satisfactory credit rating.

### Sheets

The price situation has been clarified by the announcement of new prices by several makers. Steps are also being taken to simplify the price structure on hot-rolled sheets. New quotations are: No. 10 hot-rolled 1.40c. Pittsburgh; No. 24 hot-rolled annealed 2c.; galvanized 2.60c.; heavy cold-rolled 1.90c.; and light cold-rolled, 2.30c., these quotations, excepting a $1 a ton reduction on No. 10 hot-rolled, being well in line with recent prices. The present range of 2.90c. to 3c. for No. 20 enameling sheets is unchanged. These prices are for the second quarter and for new business during the remainder of this quarter. While business from miscellaneous sources held up fairly well the past week, little came from the automotive industry.

### Strip Steel

Shipments of hot and cold-rolled strip scheduled for this week for certain General Motors units have been cancelled and demand from other automotive sources has slackened. Hot strip is firm at 1.45c., Pittsburgh. Cold-rolled material is unchanged at 1.80c. to 2c., Cleveland.

### Scrap

Business is virtually at a standstill as consumers who have been taking scrap in limited quantities have shut off on shipments, this evidently being because of the bank situation. As a result, prices have weakened 50c. to 75c. a ton on machine shop and shoveling turnings and on borings and turnings and No. 2 busheling.

# St. Louis Steel Trade Proceeding Cautiously

ST. LOUIS, March 7.—The banking holiday has made no apparent change in an already stagnant pig iron market. Foundries are continuing to operate on orders in hand, and the steel mills contemplate no immediate curtailment of the melt. Prices are unchanged.

### Steel

Operations of open-hearth furnaces have not been curtailed as a result of the banking holiday, which became effective in Missouri last Saturday. Shipments from the mills on orders continue, with some caution being exercised to learn before shipping whether the customer or contractor still wishes the material. One large mill has called in its salesmen, because of the difficulties of getting money to them. The only instructions received from mill headquarters so far is to not accept checks.

Bids by April 4 have been asked for by the Treasury Department at Washington for the Federal building here, which will require 6500 tons of structural steel.

### Scrap

Because of low prices, the Terminal Railway Association sold none of the 8500 tons of scrap iron offered to dealers last week. There is no buying. Prices are nominally unchanged.

# Buffalo Pig Iron Sales Less Than 1000 Tons

BUFFALO, March 6.—Local producers of pig iron sold during the past week less than 1000 tons, all in small lots. No sizable inquiry is out.

### Steel

The Lackawanna plant of Bethlehem Steel expects to operate four open-hearth furnaces, and possibly five, throughout the week. During the latter part of last week this plant operated at one time six open-hearths and wound up the week with five. Republic Steel continues to operate two furnaces, this operation having been maintained since Feb. 12. Wickwire Spencer is operating one open-hearth. An award of 1950 tons of fabricated structural steel for Gowanda State Hospital was made to the McClintic-Marshall Corpn.

### Scrap

No transactions of any nature were reported during the past week. Dealers note a firming tendency in prices.

# Detroit Scrap Stronger

DETROIT, March 7.—The local scrap market was sentimentally stronger the past week, with hydraulic bundles up 25c. a ton and borings and turnings especially firm. Dealers expect little business in the next few days on account of the banking situation.

# New York Steel Trade Halted; Japan Inquiries for Tin Plate

## R. F. C. Loan Requested for New Hudson Bridge, Calling for 360,000 Tons of Steel

NEW YORK, March 7. — Steel business in this territory has come almost to a halt this week as a result of the bank holiday. The effects of widespread closing of banks last week were felt in the local steel trade, though New York banks had not then closed. With the announcement of a national holiday, there was a further contraction in the volume of business. One important steel company immediately got in touch with all of its customers who had steel on order to ascertain whether shipments should be made. There were very few outright cancellations, but some customers asked for deferred delivery. However, a large majority of steel consumers wanted the steel for work in process, the chief difficulty being the matter of cash for payment of railroad freight charges. Nearly all steel companies withdrew salesmen from the road.

In view of the suspension of foreign exchange, export inquiries from Japan for tin plate and tin plate wasters came as a surprise. The inquires called for 1000 tons of tin plate and 500 tons or more of wasters for prompt shipment. It is presumed that the Japanese may have purchased sufficient exchange to cover these purchases before the bank closing brought suspension in the exchange markets. In general, however, the export or import of steel products will be suspended until the banks reopen, and will even then be difficult, in the opinion of both exporters and importers, until foreign exchange in relation to the dollar is on a stabilized basis.

A development of interest is the application filed yesterday by a group of New York promoters with the Reconstruction Finance Corporation for a preliminary loan of $100,000,000 for initial work on a bridge across the Hudson at Fifty-seventh Street, New York. Steel requirements for the entire project are estimated at 360,000 tons. Although the bridge will be of approximately the same length as the George Washington bridge, about 3500 ft., the amount of steel required will be double that used in that bridge. The United States Navy is expected to take bids soon on a floating dry dock for San Diego, Cal., calling for 2100 tons of plates, shapes and bars.

Announcement of second quarter prices for sheets is the outstanding development in the price situation. Efforts are being made to strengthen other steel products, especially plates, which are quoted at 1.45c. to 1.60c. a lb., Coatesville, with good-sized orders going at 1.40c. Cold-rolled strip steel is nominally 1.80c. to 1.90c., Pittsburgh or Cleveland, but sales have been made at 1.75c.

### Pig Iron

No variation in the character of demand could be noted in the past week. Specific inquiry is still restricted to stray car lots. Sales volume also reflected no change, bookings for the week totaling 900 tons in comparison with a like amount the week before and 800 tons a fortnight ago. Effects of the bank holiday on trading during the current week are likely to be pronounced. Business is naturally hampered by credit difficulties, with an attendant let-down in pressure to book new orders for pig iron. Prices are consequently nominal at unchanged levels.

### Reinforcing Bars

Fresh specifications are meager. Awards are also restricted. The only important letting reported during the week covered 550 tons for an apartment building at Newark, N. J., to Faitoute Iron & Steel Co. The minimum price of 1.40c., Pittsburgh, for 40, 50 and 60-ft. lengths is apparently firm.

### Scrap

With domestic business arrested by the bank moratorium, leading scrap brokers are concentrating on export movement of steel scrap. Loading of No. 1 and No. 2 heavy melting grades continues briskly. The former grade is evidently plentiful at $5 a ton, on barge, while the latter grade is procurable at $3.50 to $4. Very little scrap is moving to domestic mills. Stove plate, which is still being delivered to Bayonne, N. J., is the only active item on the remainder of the list.

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# Gray Iron Institute To Meet in Cleveland

Numerous topics of interest to the gray iron industry will be discussed at the annual meeting of the Gray Iron Institute to be held at the Hotel Cleveland, Cleveland, March 22. Following the reports of officers and committees there will be cost, technical and merchandising sessions. The program as announced is:

*Cost Session*

"Progress in Cost Activities," by John L. Carter, Montclair, N. J., vice-president of the institute.

"Importance of Classified Molding Costs," by Charles A. Klaus, Eastern cost consultant.

"The Why of Industry Standards," by P. E. Rentschler, president, Hamilton Foundry & Machine Co., Hamilton, Ohio.

"Relation of Uniform Costing to Profits of Individual Members," by A. C. Denison, Fulton Foundry & Machine Co., Cleveland.

*Technical Session*

"The Forward March of Gray Iron," J. D. Coltman, Bullard Machine Tool Co.

"Specifications for Gray Iron Castings": Founder's Viewpoint, A. C. Ziebell, Universal Foundry Co., Oshkosh. Wis.; Buyer's Viewpoint, W. W. MacMillen, National Malleable & Steel Castings Co., Cleveland, chairman of the iron and steel committee of the National Association of Purchasing Agents.

"Properties of Gray Iron for Light Structures Analyzed," report of light gray iron sub-committee, E. B. Sherwin, Chicago Hardware Foundry Co., North Chicago.

*Merchandising Session*

"Gray Iron's Opportunity," C. B. Magrath, Northwestern Foundry Co., Chicago.

"Our Company's Viewpoint on Marketing," Walter L. Seelbach, Forest City Foundries Co., Cleveland, past president of the institute.

"How We Cashed in on a Sales Plan," John Diedrich, Blackhawk Foundry Co., Davenport, Iowa.

"New Uses for Gray Iron—Development—Application," Arthur J. Tuscany, manager of the institute.

Other subjects are:

"The Gray Iron Institute Fire Insurance Plan," William J. Grede, Liberty Foundry Co., Wauwatosa, Wash.

"Speaking as a Subscriber," J. H. Bruce, Bowler Foundry Co., Cleveland.

Following the technical session there will be a round table on control, technical sales and other problems.

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# Railroad Equipment

**Delaware, Lackawanna & Western** has ordered, subject to approval, two 600-hp. oil-electric locomotives, one each from Ingersoll-Rand Co. and from American Locomotive Co.

**Chesapeake & Ohio** has ordered air-conditioning equipment to be installed in six passenger cars by Pullman Car & Mfg. Corpn.

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Structural steel welding, a complete review, will be a feature of the annual meeting of the American Welding Society, to be held at the Engineering Societies Building, New York, April 27 and 28. Important committee reports, as well as research reports of the American Bureau of Welding, are scheduled for discussion. The fall meeting of the society will be held in Detroit the week of Oct. 2, in connection with the Metal Congress and Exposition.

# Relief From Imports of Steel Must Come From Tariff Commission

WASHINGTON, March 7.—Administrative relief, if any, that the steel industry may expect from low-priced steel importations will have to come from the Tariff Commission. This has been made clear following the circular letter of the acting commissioner of customs, advising collectors of customs not to further withhold appraisement covering steel, and other imports "where it appears to the satisfaction of the appraising officer that the purchase price or exporter's sales price is not less than the fair value."

The instruction is equivalent to a finding of no-dumping of steel. Dumping had been charged by the American Iron and Steel Institute. The institute still has complaints before the Tariff Commission seeking higher duties on a wide range of steel products. The commission is studying the situation. Its final action obviously cannot be known until it has reported to the President. The Dow circular does not apply to cases where suspected dumping of steel has been found, as is the case with several products from Germany.

# Fabricated Structural Steel

## Awards Decline—New Projects Lightest in Many Months

LETTINGS of 10,250 tons the past week dropped to almost one-half of the total reported a week ago. The outstanding award is 5000 tons for a post office in St. Paul, Minn.; a State hospital at Gowanda, N. Y., requires 1950 tons. New projects of 1600 tons are the smallest since the first week in January, 1932. Awards follow:

### NORTH ATLANTIC STATES

**Newport, R. I.,** 270 tons, Naval War College, to Pittsburgh Bridge & Iron Co.

**New York,** 540 tons, Women's National Republican Club, to Bethlehem Fabricators, Inc.

**Gowanda, N. Y.,** 1950 tons, State hospital, to McClintic-Marshall Corpn.

**Norristown, Pa.,** 160 tons, Pennsylvonia Railroad bridge, to Phoenix Bridge Co.

### SOUTH AND SOUTHWEST

**Bourbon, Ky.,** 150 tons, State highway bridge, to American Bridge Co.

**Belmont, N. C.,** 730 tons, State highway bridge, to McClintic-Marshall Corpn.

**Daytona Beach, Fla.,** 190 tons, post office, to W. M. White Steel Construction Co., St. Petersburg, Fla.

**Tyler, Tex.,** 350 tons, post office, to McClintic-Marshall Corpn.

### CENTRAL STATES

**Chicago,** 150 tons, electric signs for Standard Oil Co., to an unnamed bidder.

**Missouri Pacific Railroad,** 130 tons, bridge in Illinois, to American Bridge Co.

**Wilmetta, Ill.,** 160 tons, waterworks building, to Midland Structural Steel Co.

**Saint Paul, Minn.,** 5000 tons, post office, to McClintic-Marshall Corpn.

**Kimberly, Wis.,** 105 tons, sluice gates, etc., for Government dam to Milwaukee Bridge Co.

**Kaukauna, Wis.,** 100 tons, sluice gates, etc., for Government dam, to Lakeside Bridge & Steel Co.

### WESTERN STATES

**Walsenburg, Colo.,** 250 tons, bridge to Midwest Steel & Iron Co.

### NEW STRUCTURAL STEEL PROJECTS

### NORTH ATLANTIC STATES

**Cambridge, Mass.,** 300 tons, post office.

**New York,** 13,000 tons, post office annex; D. M. W. Contracting Co., Brooklyn, low bidder for general contract; George A. Fuller Co., New York, second low bidder.

**Woodhaven, N. Y.,** 750 tons, building for Liberty Brewery, Inc.

**Baltimore,** 650 tons, Appraisers Stores, Pike & Cook, 416 South Fifth Street, Minneapolis, general contractors.

### SOUTH AND SOUTHWEST

**Deep Creek, Va., and South Mills, N. C.,** 200 tons, two Government bascule bridges.

**State of Arkansas,** 200 tons, highway bridges.

### CENTRAL STATES

**Columbus, Ohio,** 2700 tons, post office; Henry Ericsson Co. low bidder on general contract.

**Chicago,** 150 tons, Polish exhibition building for Century of Progress Fair.

**Saint Louis,** 6500 tons, Federal building, bids to be opened April 4.

**Milwaukee,** 154 tons, steel sheet piling for North Manitou Shoal lighthouse project; Illinois Steel Co., low bidder.

### WESTERN STATES

**San Francisco,** 5000 tons, post office, N. P. Severin & Co., low bidder on general contract.

### FABRICATED PLATE

### AWARDS

**Wheeling, W. Va.,** 470 tons, three barges for Constanzo Coal Co., to American Bridge Co.

**Wilmette, Ill.,** 300 tons, 30-in. water pipe line, to Alco Products, Inc.

**Vicksburg, Miss.,** 136 tons, oil tank barge for United States Engineers, to Dravo Contracting Co.

# Pipe Lines

**Crescent Refining Co.,** Holdenville, Okla., H. H. Pegg, Allen, Okla., engineer, in charge, plans 4-in. steel pipe line from oil properties to new refinery at Holdenville.

**Sun Oil Co.,** Houston, Tex., plans steel pipe line from oil properties at Conroe, Montgomery County, Tex., to point near Humble, Tex., where connection will be made with main trunk line to oil terminal near Beaumont, Tex.

**Tacoma, Wash.** plans purchase of about 33,500 ft. of 54-in. steel pipe, 6000 ft. of 48-in., 11,000 ft. of 42-in. in connection with extensions and improvements in water supply system for main trunk line. Financing in amount of $1,335,000 is being arranged.

**Hobart, Okla.,** asks bids, closing about March 20, for 14-in. steel or cast iron pipe (alternative bids) for water supply. W. R. Holway, 302 East Eighteenth Street, Tulsa, Okla., is engineer.

**Clinton, La.,** has called special election March 21 to approve bonds for $45,000 for main steel pipe line for natural gas supply and smaller steel pipe lines for distribution service.

# Bids for Hoover Dam Turbines on March 10

WASHINGTON, March 7.—The Bureau of Reclamation, Interior Department, again has postponed opening of bids for five 115,000 h.p. and two 55,000 h.p. turbines for the Hoover dam power plant, this time to March 10. The delay was occasioned in each of two instances because Congress had not yet passed the Postoffice-Treasury bill, which carries the so-called "Buy American" amendment.

In the absence of this provision to protect it, the Interior Department would have been forced to award the business, aggregating about $3,000,000 to the lowest bidder, which, it is reported, would have been a German maker. Later on bids will be opened for about $14,000,000 for machinery equipment for the plants. Bids for the work will be opened in the Denver office of the bureau.

# Reinforcing Steel

## Awards 810 Tons—New Projects 370 Tons

**Newark, N. J.,** 550 tons, Prudential Insurance Co. apartment building, to Faitoute Iron & Steel Co.

**State of Illinois,** 100 tons, paving, to Concrete Engineering Co.

**Monterey County, Cal.,** 157 tons, State highway paving, to Soule Steel Co.

### NEW REINFORCING BAR PROJECTS

**Cambridge, Mass.,** 100 tons, post office.

**San Francisco County, Cal.,** 269 tons, Bayshore State highway; bids March 22.

# Cast Iron Pipe

**Boston** has readvertised for bids on 1200 tons of 8-, 12- and 16-in. on which Warren Foundry & Pipe Corpn. was previously low bidder.

**Gloucester, Mass.,** has awarded 6000 ft. of 8-in., 2000 ft. 10-in. and 600 ft. of 20-in. pipe to Warren Foundry & Pipe Co.

**Massachusetts** closes bids March 16 on 975 tons of 20-in. pipe and special castings for city of Revere.

**Medford, Mass.,** has closed with Warren Foundry & Pipe Co. for an unstated tonnage of 6- and 10-in.

**American Cast Iron Pipe Co.** is low bidder on 1400 tons of 12- to 16-in. for city of San Francisco.

**San Bruno, Cal.,** has awarded 210 tons of 4- to 8-in. to Pacific States Cast Iron Pipe Co.

**Santa Monica, Cal.,** will take bids March 10 on 100 tons of 6-in. class B.

**Burbank, Cal.,** will take bids March 14 on 136 tons of 8-in.

**Glendale, Cal.,** took bids March 9 on 474 tons of 24-in.

# Lead Experiences Brisk Demand After Prolonged Inactivity

## Trading in Other Non-Ferrous Metals Virtually Suspended During Bank Recess

NEW YORK, March 7.—Trading in the domestic copper market has been halted by the bank moratorium. Electrolytic has remained nominal, therefore, at the last published quotation, which on Friday was 5c., delivered Connecticut. Lake copper has likewise remained stationary at 5c., delivered New York. There is little likelihood of any trading in copper until the banking and credit situation is clarified. Meanwhile, consumers are showing more interest. Some buyers have already sought protection of their future needs at the current nominal quotation. No seller, however, has yet indicated a willingness to deal in futures. With commodity values pointing toward higher levels, future offerings of copper, as well as of other non-ferrous metals, are wholly absent. A fair demand was experienced today in European markets, following an almost complete cessation of trading yesterday. Most sales abroad were made on local currency bases. Based on the last published rates of exchange, values on the Continent today ranged between 4.95c. and 5c.

### Lead

This market, in contrast to the other non-ferrous metals, yesterday and today experienced the liveliest demand in some weeks. Two large producers found ready response to their offerings, with the result that their daily intakes were easily disposed of. Though some of the buying was flavored with speculative covering against possible higher prices, most of it represented demand for immediate consumption. The leading Eastern and Midwestern producers continue to hold their contracting bases at 3c., New York, and 2.87½c., St. Louis.

### Tin

An active market toward the latter part of last week was brought to a complete stop by the banking recess. Prior to the halt, spot Straits tin at New York, backed by a strong, spot demand and favorable statistical news, swung upward from 23.20c. on Feb. 28 to 23.80c. on March 3. Highly erratic sterling exchange during that period caused considerable confusion in establishing the dollar price. THE IRON AGE postings for March 1, 2 and 3 are consequently based on average daily prices. Until sterling exchange is reinstated, resumption of trading and publication of New York prices will obviously be impossible. In London, values were off slightly for the week. Quotations there this morning were £145 12s. 6d. a ton for spot standard, £146 5s. for future standard, and £151 7s. 6d. for spot Straits. No change for the week occurred in the Singapore market, which today was quotable at £150 10s. A 1063-ton decrease in February brought the world's visible tin supply down to 43,160 tons. Carryover in the Straits of 9791 tons, however, established the total visible supply on March 1 at 52,591 tons, which compares with 60,423 tons on March 1, 1932.

### Zinc

Though trading in this market is virtually suspended, some smelters are doling out small lots to take care of imperative needs of regular customers. Sellers, however, are not soliciting new business and refuse definitely to sell forward metal. The small lots that are being placed are offered on a basis of price to be established as soon as banking and credit thaw out. The last published quotations were made on March 3, when prime Western sold at 2.70c., East St. Louis, or 3.07c., New York, representing a slight advance over THE IRON AGE posting a week ago.

**The Week's Prices. Cents Per Pound for Early Delivery**

| | March 1 | March 2 | March 3 | March 4 | March 6 | March 7 |
|---|---|---|---|---|---|---|
| Electrolytic copper, N. Y.* | 4.75 | 4.75 | 4.75 | 4.75 | 4.75 | 4.75 |
| Lake copper, New York | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 |
| Straits tin, Spot, N. Y. | 23.50 | 23.65 | 23.80 | .... | .... | .... |
| Zinc, East St. Louis | 2.70 | 2.70 | 2.70 | 2.70 | .... | .... |
| Zinc, New York | 3.07 | 3.07 | 3.07 | 3.07 | .... | .... |
| Lead, St. Louis | 2.87½ | 2.87½ | 2.87½ | 2.87½ | 2.87½ | 2.87½ |
| Lead, New York | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 |

* Refinery quotations price ¼c. higher delivered in Connecticut.
Aluminum, 98 to 99 per cent pure, 22.90c. a lb., delivered.
Nickel electrolytic cathode, 35c. a lb., delivered; shot and ingot, 36c. a lb., delivered.
Antimony, 5.62½c. a lb., New York.
Brass ingots, 85-5-5-5, 5.25c. a lb., New York and Philadelphia.

**From New York Warehouse**

*Delivered Prices, Base per Lb.*

| | |
|---|---|
| Tin, Straits pig | 25.50c. to 26.50c. |
| Tin, bar | 27.50c. to 29.50c. |
| Copper, Lake | 7.50c. to 8.50c. |
| Copper, electrolytic | 7.25c. to 8.25c. |
| Copper, casting | 7.00c. to 8.00c. |
| *Copper sheets, hot-rolled | 13.12½c. |
| *High brass sheets | 10.50c. |
| *Seamless brass tubes | 12.75c. |
| *Seamless copper tubes | 11.87½c. |
| *Brass rods | 8.00c. |
| Zinc, slabs | 4.37½c. to 4.87½c. |
| Zinc sheets (No. 9), casks | 9.25c. to 9.50c. |
| Lead, American pig | 3.75c. to 4.25c. |
| Lead, bar | 5.25c. to 6.25c. |
| Lead, sheets | 6.75c. |
| Antimony, Asiatic | 8.00c. to 9.00c. |
| Alum., virgin, 99 per cent plus | 23.30c. |
| Alum. No. 1 for remelting, 98 to 99 per cent | 16.00c. |
| Solder, ½ and ½ | 15.50c. to 16.50c. |
| Babbitt metal commercial grade | 21.00c. to 32.00c. |

*These prices are also for delivery from Chicago and Cleveland warehouses.

**From Cleveland Warehouse**

*Delivered Prices per Lb.*

| | |
|---|---|
| Tin, Straits pig | 27.25c. |
| Tin, bar | 29.25c. |
| Copper, Lake | 6.125c. |
| Copper, electrolytic | 6.125c. |
| Copper, casting | 5.875c. |
| Zinc, slab | 4.25c. to 4.50c. |
| Lead, American pig | 3.75c. to 4.00c. |
| Lead, bar | 7.25c. |
| Antimony, Asiatic | 8.50c. |
| Babbitt metal, medium grade | 16.50c. |
| Babbitt metal, high grade | 31.00c. |
| Solder, ½ and ½ | 17.00c. |

**Old Metals, Per Lb., New York**

*Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)*

| | Dealers' Buying Prices | Dealers' Selling Prices |
|---|---|---|
| Copper, hvy. crucible | 3.75c. | 4.375c. |
| Copper, hvy. and wire | 3.50c. | 4.25c. |
| Copper, light and bottoms | 2.625c. | 3.50c. |
| Brass, heavy | 1.625c. | 2.25c. |
| Brass, light | 1.25c. | 1.875c. |
| Hvy. machine composition | 2.50c. | 3.00c. |
| No. 1 yel. brass turnings | 2.125c. | 2.625c. |
| No. 1 red brass or compos. turnings | 2.375c. | 2.875c. |
| Lead, heavy | 2.125c. | 2.50c. |
| Zinc | 1.25c. | 1.625c. |
| Cast aluminum | 3.75c. | 5.00c. |
| Sheet aluminum | 8.00c. | 9.75c. |

## Industrial Finances

In its pamphlet report for 1932, Bethlehem Steel Corpn. gives some figures on its last year's operations not contained in its preliminary report issued a few weeks ago. The daily average number of employees working for the corporation in the United States during the year was 30,364 compared with 45,258 in 1931. The company paid out in pensions last year $782,158, compared with $699,503 the previous year. In addition, $1,171,049 was paid to sick or disabled employees under the company's relief plan. The number of stockholders at the end of the year was 92,577, of whom 3752 held both preferred and common stock. The report states that the company's taxes last year were equivalent to $4.26 per ton of rolled steel and other finished products produced during the year. No payments were made by the company last year under the bonus system.

American Steel Foundries reports a net loss for 1932 of $1,526,243. The company states that at no time in its history was its business or that of its subsidiary, the Griffin Wheel Co., so low. The total shipments of the company last year were 158,447 tons, compared with 243,894 tons in 1931.

# Prices of Finished and Semi-Finished Steel, Coke, Coal, Cast Iron Pipe

## BARS, PLATES, SHAPES

### Iron and Steel Bars

*Soft Steel*

| | Base per Lb. |
|---|---|
| F.o.b. Pittsburgh mill | 1.60c. |
| F.o.b. Chicago | 1.70c. |
| Del'd Philadelphia | 1.91c. |
| Del'd New York | 1.95c. |
| Del'd Detroit | 1.80c. |
| F.o.b. Cleveland | 1.65c. |
| F.o.b. Lackawanna | 1.70c. |
| F.o.b. Birmingham | 1.75c. |
| C.i.f. Pacific ports | 2.10c. |

*Billet Steel Reinforcing*
(as quoted by distributors)

| | |
|---|---|
| F.o.b. P'gh mills, 40, 50, 60-ft. | 1.40c |
| F.o.b. Birmingham, mill lengths | 1.65c. |
| F.o.b. Cleveland | 1.40c. |

*Rail Steel*

| | |
|---|---|
| F.o.b. mills, east of Chicago dist. | 1.30c. |
| F.o.b. Chicago Heights mills | 1.50c. |

*Iron*

| | |
|---|---|
| Common iron, f.o.b. Chicago | 1.60c. |
| Refined iron, f.o.b. P'gh mills | 2.75c. |
| Common iron, del'd Philadelphia | 1.86c. |
| Common iron, del'd New York | 1.90c. |

### Tank Plates

| | Base per Lb. |
|---|---|
| F.o.b. Pittsburgh mill | 1.60c. |
| F.o.b. Chicago | 1.70c. |
| F.o.b. Birmingham | 1.75c. |
| Del'd Cleveland | 1.8035c. |
| Del'd Philadelphia | 1.5635c. to 1.7135c. |
| F.o.b. Coatesville | 1.45c. to 1.60c. |
| F.o.b. Sparrows Point | 1.45c. to 1.60c. |
| Del'd New York | 1.648c. to 1.798c. |
| C.i.f. Pacific ports | 2.00c. |
| Wrought iron plates, f.o.b. P'gh | 3.00c. |

### Structural Shapes

| | Base per Lb. |
|---|---|
| F.o.b. Pittsburgh mill | 1.60c. |
| F.o.b. Chicago | 1.70c. |
| F.o.b. Birmingham | 1.75c. |
| F.o.b. Lackawanna | 1.70c. |
| F.o.b. Bethlehem | 1.70c. |
| Del'd Cleveland | 1.8035c. |
| Del'd Philadelphia | 1.7495c. |
| Del'd New York | 1.86775c. |
| C.i.f. Pacific ports (standard) | 2.10c. |
| C.i.f. Pacific ports (wide flange) | 2.20c. |

### Steel Sheet Piling

| | Base per Lb. |
|---|---|
| F.o.b. Pittsburgh | 1.90c. |
| F.o.b. Chicago mill | 2.05c. |
| F.o.b. Buffalo | 2.00c. |

### Alloy Steel Bars

(F.o.b. Pittsburgh, Chicago, Buffalo, Massillon or Canton.)

Alloy Quantity Bar Base, 2.45c. to 2.65c. per Lb.

| S.A.E. Series Numbers | Alloy Differential per 100 Lb. |
|---|---|
| 2000 (1/2% Nickel) | $0.25 |
| 2100 (1 1/4% Nickel) | 0.55 |
| 2300 (3 1/2% Nickel) | 1.50 |
| 2500 (5% Nickel) | 2.25 |
| 3100 Nickel Chromium | 0.55 |
| 3200 Nickel Chromium | 1.35 |
| 3300 Nickel Chromium | 3.80 |
| 3400 Nickel Chromium | 5.20 |
| 4100 Chromium Molybdenum (0.16 to 0.25 Molybdenum) | 0.50 |
| 4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum) | 0.70 |
| 4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.50 to 2.00 Nickel) | 1.05 |
| 5100 Chromium Steel (0.60 to 0.90 Chromium) | 0.35 |
| 5100 Chromium Steel (0.80 to 1.10 Chromium) | 0.45 |
| 5100 Chromium Spring Steel | 0.20 |
| 6100 Chromium Vanadium Bar | 1.20 |
| 4100 Chromium Vanadium Spring Steel | 0.95 |
| 9250 Silicon Manganese Spring Steel (flats) | 0.25 |
| Rounds and Squares | 0.50 |
| Chromium Nickel Vanadium | 1.50 |
| Carbon Vanadium | 0.95 |

Above prices are for hot-rolled steel bars, forging quality. The differential for cold-drawn bars is 3/4c. a lb. higher, with standard classification for cold-finished alloy steel bars applying. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis.

Billets under 4 x 4 in. carry the steel bar base. Slabs with a section area of 16 in. or over carry the billet price. Slabs with sectional area of less than 16 in. or less than 2 1/2 in. thick, regardless of sectional area, take the bar price.

### Cold Finished Bars*

| | |
|---|---|
| Bars, f.o.b. Pittsburgh mill | 1.70c. |
| Bars, f.o.b. Chicago | 1.75c. |
| Bars, Cleveland | 1.75c. |
| Bars, Buffalo | 1.75c. |
| Bars, Detroit | 1.90c. |
| Bars, eastern Michigan | 1.95c. |
| Shafting, ground, f.o.b. mill, 1 1/4 in. | 3.00c. |
| 1-3/16 to 1 1/4 in. | 2.50c. |
| 1-9/16 to 1 3/4 in. | 2.35c. |
| 1-15/16 to 2 1/8 in. | 2.20c. |
| 2-15/16 to 6 in. | 2.05c. |

* In quantities of 10,000 to 19,999 lb.

## SHEETS, STRIP, TIN PLATE TERNE PLATE

### Sheets

*Hot-Rolled*

| | |
|---|---|
| No. 10, f.o.b. Pittsburgh | 1.40c. |
| No. 10, f.o.b. Chicago mill | 1.50c. |
| No. 10, del'd Philadelphia | 1.71c. |
| No. 10, f.o.b. Birmingham | 1.55c. |
| No. 10, c.i.f. Pacific Coast ports | 2.17 1/2c. |

*Hot-Rolled Annealed*

| | |
|---|---|
| No. 10, Pittsburgh | 1.55c. |
| No. 10, Chicago mills | 1.65c. |
| No. 10, Birmingham | 1.70c. |
| No. 10, Pacific Coast ports | 2.32 1/2c. |
| No. 10, wrought iron, Pittsburgh | 3.60c. |

*Hot-Rolled Annealed*

| | |
|---|---|
| No. 24, f.o.b. Pittsburgh | 2.00c. |
| No. 24, f.o.b. Chicago mills | 2.10c. |
| No. 24, del'd Philadelphia | 2.31c. |
| No. 24, f.o.b. Birmingham | 2.15c. |
| No. 24, c.i.f. Pacific Coast ports | 2.85c. |
| No. 24, wrought iron, Pittsburgh | 4.30c. |

*Heavy Cold-Rolled*

| | |
|---|---|
| No. 10 gage, f.o.b. Pittsburgh | 1.90c. |
| No. 10 gage, f.o.b. Chicago mills | 2.00c. |
| No. 10 gage, del'd Philadelphia | 2.21c. |

*Light Cold-Rolled*

| | |
|---|---|
| No. 20 gage, f.o.b. Pittsburgh | 2.30c. |
| No. 20 gage, f.o.b. Chicago mills | 2.40c. |
| No. 20 gage, del'd Philadelphia | 2.61c. |

Note: Automobile body stock and steel furniture sheets to be quoted henceforth on cold-rolled sheet base prices, with extras for drawing quality.

*Galvanized Sheets*

| | |
|---|---|
| No. 24 f.o.b. Pittsburgh | 2.60c. |
| No. 24 f.o.b. Chicago mills | 2.70c. |
| No. 24, del'd Philadelphia | 2.91c. |
| No. 24 f.o.b. Birmingham | 2.75c. |
| No. 24, c.i.f. Pacific Coast ports, 3.25c. to | 3.50c. |
| No. 24, wrought iron, Pittsburgh | 4.95c. |

*Long Ternes*

| | |
|---|---|
| No. 24, unassorted, 8-lb. coating, f.o.b. Pittsburgh | 2.75c. |

*Vitreous Enameling Stock*

| | |
|---|---|
| No. 10, f.o.b. Pittsburgh | 2.40c. to 2.50c. |
| No. 20, f.o.b. Pittsburgh | 2.90c. to 3.00c. |

*Tin Mill Black Plate*

| | |
|---|---|
| No. 28, f.o.b. Pittsburgh | 2.30c. |
| No. 28, Chicago mill | 2.40c. |

### Tin Plate

| | Base per Box |
|---|---|
| Standard cokes, f.o.b. P'gh district mill | $4.25 |
| Standard cokes, f.o.b. Gary | 4.35 |

### Terne Plate

(*F.o.b. Morgantown or Pittsburgh*)
(Per Package, 20 x 28 in.)

| | |
|---|---|
| 8-lb. coating I.C. | $9.50 |
| 15-lb. coating I.C. | 12.00 |
| 20-lb. coating I.C. | 13.00 |
| 25-lb. coating I.C. | 14.10 |
| 30-lb. coating I.C. | 14.90 |
| 40-lb. coating I.C. | 16.70 |

### Hot-Rolled Hoops, Bands, Strips and Flats under 1/4 In.

| | Base per Lb. |
|---|---|
| All widths up to 24 in., Pittsburgh | 1.45c. |
| All widths up to 24 in., Chicago | 1.45c. to 1.55c. |
| Cooperage stock, P'gh | 1.55c. to 1.60c. |
| Cooperage stock, Chicago | 1.65c. to 1.70c. |

### Cold-Rolled Strips

| | |
|---|---|
| F.o.b. Pittsburgh | 1.80c. to 2.00c. |
| F.o.b. Cleveland | 1.80c. to 2.00c. |
| Del'd Chicago | 2.20c. to 2.30c. |
| F.o.b. Worcester | 2.00c. to 2.10c. |
| Fender stock, No. 20 gage, Pittsburgh or Cleveland | 2.55c. to 2.65. |

## WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland.)

Extras of 10c. a 100 lb. on mixed and joint carloads, 20c. on pool carloads and 30c. on less than carloads are applied on all merchant wire products. In carloads and mixed carloads a discount of 10 per cent on extras is allowed.

*To Manufacturing Trade*

| | |
|---|---|
| Bright wire | 2.10c. |
| Spring wire | 3.10c. |

*To Jobbing Trade*

| | Base per Keg |
|---|---|
| Standard wire nails | $1.85 |
| Smooth coated nails | 1.85 |
| Galvanized nails | 2.35 |
| | Base per 100 Lb. |
| Smooth annealed wire | $2.25 |
| Smooth galvanized wire | 2.60 |
| Polished staples | 2.55 |
| Galvanized staples | 2.80 |
| Barbed wire, galvanized | 2.35 |
| Woven wire fence No. 9 gage, base column, per net ton | $50.00 |

*Chicago and Anderson, Ind., mill prices are $1 a ton over Pittsburgh base; Duluth, Minn., and Worcester, Mass., mill $2 a ton over Pittsburgh, and Birmingham mill $3 a ton over Pittsburgh.*

## STEEL AND WROUGHT PIPE AND TUBING

### Welded Pipe

**Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills**

*Butt Weld*

| Steel Inches | Steel Black | Steel Galv. | Wrought Iron Inches | Wrought Iron Black | Wrought Iron Galv. |
|---|---|---|---|---|---|
| 1/8 | 51 1/2 | 28 1/2 | 1/8 | +95 | +142 1/2 |
| 1/4 to 3/8 | 57 | 34 | 1/4 & 3/8 | +5 | +29 1/4 |
| 1/2 | 62 | 49 1/2 | 1/2 | 28 | 10 1/2 |
| 3/4 | 65 1/2 | 55 | 3/4 | 33 | 16 1/2 |
| 1 to 3 | 67 1/2 | 57 | 1 & 1 1/4 | 36 | 20 1/2 |
| | | | 1 1/2 | 40 | 23 |
| | | | 2 | 38 | 21 |

*Lap Weld*

| | | | | | |
|---|---|---|---|---|---|
| 2 | 61 | 50 1/2 | 2 | 26 | 12 1/2 |
| 2 1/2 to 6 | 64 1/2 | 54 | 2 1/2 to 3 1/2 | 33 | 18 1/2 |
| 7 and 8 | 62 | 51 | 4 to 6 | 35 | 22 |
| 9 and 10 | 60 | 49 | 7 and 8 | 34 | 21 1/4 |
| 11 and 12 | 59 | 48 | 9 to 12 | 31 | 16 1/2 |

*Butt Weld, extra strong, plain ends*

| | | | | | |
|---|---|---|---|---|---|
| 1/8 | 48 | 33 | 1/8 | +17 | +49 1/2 |
| 1/4 to 3/8 | 53 1/2 | 38 1/4 | 1/4 & 3/8 | +7 | +41 |
| 1/2 | 59 | 49 1/2 | 1/2 | 28 | 12 1/2 |
| 3/4 | 63 1/2 | 54 | 3/4 | 33 | 17 1/2 |
| 1 to 1 1/4 | 65 1/2 | 56 | 1 to 2 | 39 | 23 |
| 2 to 3 | 66 1/2 | 57 | | | |

*Lap Weld, extra strong, plain ends*

| | | | | | |
|---|---|---|---|---|---|
| 2 | 59 | 49 1/2 | 2 | 34 | 18 1/2 |
| 2 1/2 to 4 | 62 1/2 | 53 | 2 1/2 to 4 | 39 | 25 |
| 4 1/2 to 6 | 62 | 52 1/2 | 4 1/2 to 6 | 38 | 24 |
| 7 to 8 | 58 | 47 | 7 & 8 | 36 | 22 |
| 9 and 10 | 51 1/2 | 40 1/4 | 9 to 12 | 26 | 13 1/2 |
| 11 and 12 | 50 1/2 | 39 1/2 | | | |

Discounts on steel and wrought iron pipe are net and not subject to any points or preferentials.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2 1/2 points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

### Boiler Tubes

**Base Discounts, f.o.b. Pittsburgh**

| Steel | | Charcoal Iron | |
|---|---|---|---|
| 2 in. and 2 1/4 in. | 38 | 1 1/4 in. | 1 |
| 2 1/2 in.—2 3/4 in. | 46 | 1 3/4 in. | 8 |
| 3 in. | 52 | 2 in.—2 1/4 in. | 13 |
| 3 1/4 in.—4 3/4 in. | 54 | 2 1/2 in.—2 3/4 in. | 16 |
| 4 in. | 57 | 3 in. | 17 |
| 4 1/2 in. to 6 in. | 46 | 3 1/4 in. to 3 1/2 in. | 18 |
| | | 4 in. | 20 |
| | | 4 1/2 in. | 21 |

On lots of a carload or more, the above base discounts are subject to a preferential of two fives on steel and of 10 per cent on charcoal iron tubes. Smaller quantities are subject to the following modifications from the base discounts:

Lap welded Steel—Under 10,000 lb., 6 points under base and one five; 10,000 lb. to carload, 4 points under base and two fives. Charoal Iron—Under 10,000 lb., 2 points under base; 10,000 lb. to carload, base and one five.

*Standard Commercial Seamless Boiler Tubes*

*Cold-Drawn*

| | | | |
|---|---|---|---|
| 1 in. | 61 | 3 in. | 46 |
| 1 1/4 to 1 1/2 in. | 53 | 3 1/4 to 3 1/2 in. | 48 |
| 1 3/4 in. | 37 | 4 in. | 51 |
| 2 to 2 1/4 in. | 32 | 4 1/2, 5 and 6 in. | 40 |
| 2 1/2 to 2 3/4 in. | 40 | | |

*Hot Rolled*

| | | | |
|---|---|---|---|
| 2 and 2 1/4 in. | 38 | 3 1/4 to 3 1/2 in. | 54 |
| 2 1/2 and 2 3/4 in. | 46 | 4 in. | 57 |
| 3 in. | 52 | 4 1/2, 5 and 6 in. | 46 |

Beyond the above base discounts a preferential discount of 5 per cent is allowed on carload lots. On less than carloads to 10,000 lb. base discounts are reduced 4 points with 5 per cent preferential; on less than 10,000 lb., base discounts are reduced 6 points with no preferential. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. in lighter than standard gages take the mechanical tube list and discounts. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

### Seamless Mechanical Tubing

| | Per Cent Off List |
|---|---|
| Carbon, 0.10% to 0.30% base (carloads) | 55 |
| Carbon, 0.30% to 40% base | 50 |

Plus differential for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.

## RAILS AND TRACK SUPPLIES

### Rails

| | Per Gross Ton |
|---|---|
| Standard, f.o.b. mill | $40.00 |
| Light (from billets), f.o.b. mill | 30.00 |
| Light (from rail steel, f.o.b. mill) | 26.00 |

### Track Equipment

| | Base per 100 Lb. |
|---|---|
| Spikes, 9/16 in. and larger | $2.15 |
| Spikes, 1/2-in. and larger | 2.30 |
| Spikes, boat and barge | 2.60 |
| Tie plates, steel | 1.75 |
| Angle bars | 2.55 |
| Track bolts, to steam railroads | 3.50 |
| Track bolts, to jobbers, all sizes, per 100 count | 73 per cent off list |

## BOLTS, NUTS, RIVETS AND SET SCREWS

### Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

| | Per Cent Off List |
|---|---|
| Machine bolts | 75 |
| Carriage bolts | 75 |
| Lag bolts | 75 |
| Plow bolts, Nos. 1, 2, 3 and 7 heads | 75 |
| Hot-pressed nuts, blank or tapped, square | 75 |
| Hot-pressed nuts, blank or tapped, hexagons | 75 |
| C.p.c. and t. square or hex nuts, blank or tapped | 75 |
| Washers* | 7.00c. to 6.75c. per lb. off list |

*F.o.b. Chicago, New York and Pittsburgh.

### Bolts and Nuts

| | Per Cent Off List |
|---|---|
| Semi-finished hexagon nuts | 75 |
| Semi-finished hexagon castellated nuts, S.A.E. | 75 |
| Stove bolts in packages, P'gh, 75, 25 and | 10 |
| Stove bolts in packages, Ch'go, 75, 25 and | 10 |
| Stove bolts in pkgs., Cleveland, 75, 25 and | 10 |
| Stove bolts in bulk, P'gh | 80 |
| Stove bolts in bulk, Chicago | 80 |
| Stove bolts in bulk, Cleveland | 80 |
| Tire bolts | 60 and 10 |

Discounts of 75 per cent off on bolts and nuts applies on carload business with jobbers and large consumers.

### Large Rivets

(1/2-in. and larger)

| | Base per Lb. |
|---|---|
| F.o.b. Pittsburgh or Cleveland | $2.25 |
| F.o.b. Chicago | 2.25 |

### Small Rivets

(7/16-in. and smaller)

| | Per Cent Off List |
|---|---|
| F.o.b. Pittsburgh | 70, 10 and 10 |
| F.o.b. Cleveland | 70, 10 and 10 |
| F.o.b. Chicago | 70, 10 and 10 |

### Cap and Set Screws

*Discounts to Jobbers*

(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)

| | Per Cent Off List |
|---|---|
| Milled cap screws, 1 in. dia. and smaller | 80 and 25 |
| Milled standard set screws, case hardened, 1 in. dia. and smaller | 75 and 10 |
| Milled headless set screws, cut thread 3/8 in. and smaller | 75 and 10 |
| Upset hex. head cap screws, U.S.S.S. or S.A.E. thread, 1 in. dia. and smaller | 80, 25 and 10 |
| Upset set screws, sq. head, 1 in. dia. and smaller | 75, 10 and 10 |
| Upset set screws, 1 1/4 in. and larger, | 75 and 10 |
| Milled studs | 70 |

## SEMI-FINISHED STEEL

### Billets and Blooms

| | Per Gross Ton |
|---|---|
| Rerolling, 4-in. to 6-in., inclusive, Pittsburgh | $26.00 |
| Rerolling, 4-in. to 6-in., inclusive, Youngstown | 26.00 |
| Rerolling, 4-in. to 6-in., inclusive, Cleveland | 26.00 |
| Rerolling, 4-in. to 6-in., inclusive, Chicago | 26.00 |
| Forging quality, Pittsburgh | 31.00 |
| Forging quality, Youngstown | 31.00 |

### Sheet Bars

(Open-Hearth or Bessemer)

| | Per Gross Ton |
|---|---|
| Pittsburgh | $26.00 |
| Youngstown | 26.00 |
| Cleveland | 26.00 |

### Slabs

(3 in. x 2 in. and under 10 in. x 10 in.)

| | Per Gross Ton |
|---|---|
| Pittsburgh | $26.00 |
| Youngstown | 26.00 |
| Cleveland | 26.00 |

(*Turn to next page*)

### Skelp

(F.o.b. Pittsburgh or Youngstown)

| | Per Lb. |
|---|---|
| Grooved | 1.60c. |
| Universal | 1.60c. |
| Sheared | 1.60c. |

### Wire Rods

(Common soft, base)

| | Per Gross Ton |
|---|---|
| Pittsburgh | $35.00 |
| Cleveland | 35.00 |
| Chicago | 36.00 |

## COKE, COAL AND FUEL OIL

### Coke

| | Per Net Ton |
|---|---|
| Furance, f.o.b. Connellsville Prompt | $1.75 to $2.00 |
| Foundry, f.o.b Connellsville Prompt | 2.50 to 4.25 |
| Foundry, by-product, Chicago ovens, for delivery outside switching districts | 7.00 |
| Foundry, by-product, delivered in Chicago switching district | 7.75 |
| Foundry, by-product, New England, delivered | 10.00 |
| Foundry, by-product, Newark or Jersey City, del'd | 8.20 to 8.81 |
| Foundry, by-product, Phila. | 8.50 |
| Foundry, by-product, Cleveland, delivered | 7.82 |
| Foundry, Birmingham | 5.00 |
| Foundry, by-product, St. Louis, f.o.b. ovens | 8.00 |
| Foundry, by-product, del'd St. Louis | 9.00 |

### Coal

| | Per Net Ton |
|---|---|
| Mine run steam coal, f.o.b. W. Pa. mines | $1.00 to $1.15 |
| Mine run coking coal, f.o.b. W. Pa. | 1.10 to 1.25 |
| Gas coal, ¾-in., f.o.b. Pa. mines | 1.25 to 1.40 |
| Mine run gas coal, f.o.b. Pa. mines | 1.20 to 1.30 |
| Steam slack, f.o.b. W. Pa. mines | 0.25 to 0.35 |
| Gas slack, f.o.b. W. Pa. mines | 0.35 to 0.45 |

### Fuel Oil

| | |
|---|---|
| *Per Gal. f.o.b. Bayonne, N. J.* | |
| No. 3 distillate | 4.00c. |
| No. 4 industrial | 3.50c. |
| *Per Gal. f.o.b. Baltimore* | |
| No. 3 distillate | 4.00c. |
| No. 4 industrial | 3.50c. |
| *Per Gal. del'd Chicago* | |
| No. 3 industrial fuel oil | 3.25c. |
| No. 5 industrial fuel oil | 2.65c. to 2.75c. |
| *Per Gal. f.o.b. Cleveland* | |
| No. 3 distillate | 5.25c. |
| No. 4 industrial | 4.75c. |

## REFRACTORIES

### Fire Clay Brick

| | Per 1000 f.o.b. Works: High-heat Duty Brick | Intermediate Duty Brick |
|---|---|---|
| Penn. | $35.00 | $25.00 to $30.00 |
| Maryland | 35.00 | 25.00 to 30.00 |
| New Jer. | $44.00 to 57.00 | |
| Ohio | 35.00 | 25.00 to 30.00 |
| Kentucky | 35.00 | 25.00 to 30.00 |
| Missouri | 35.00 | 30.00 |
| Illinois | 35.00 | 25.00 to 30.00 |
| Ground fire clay, per ton | 6.50 | |

### Chrome Brick

| | Per Net Ton |
|---|---|
| Standard size | $42.50 |

### Silica Brick

| | Per 1000 f.o.b. Works |
|---|---|
| Pennsylvania | $38.00 |
| Chicago | 47.00 |
| Birmingham | 50.00 |
| Silica clay, per ton | 8.00 |

### Magnesite Brick

| | Per Net Ton |
|---|---|
| Standard sizes, burned, f.o.b. Baltimore and Chester, Pa. | $61.50 |
| Unburned, f.o.b. Baltimore | 52.00 |
| Grain magnesite, f.o.b. Baltimore and Chester, Pa. | 38.50 |
| Domestic, f.o.b. Chewelah, Wash. | 20.90 |

## CAST IRON PIPE

| | Per Net Ton |
|---|---|
| 6-in. and larger, del'd Chicago | $41.40 |
| 4-in., del'd Chicago | 44.40 |
| 6-in., and larger, del'd New York | 35.30 |
| 4-in., del'l New York | 38.30 |
| 6-in., and larger, Birm'ham | 33.00 |
| 4-in., Birmingham | 36.00 |

Class "A" and gas pipe, $3 extra.

# Pig Iron, Ores, Ferroalloys

### VALLEY

Per Gross ton, f.o.b. Valley furnace:

| | |
|---|---|
| Basic | $13.50 |
| Bessemer | 15.00 |
| Gray Forge | 14.50 |
| No. 2 foundry | 14.50 |
| N. 3 foundry | 14.00 |
| Malleable | $14.50 to 15.00 |
| Low phos., copper free | 23.00 to 25.00 |

Freight rate to Pittsburgh or Cleveland district, $1.89.

### PITTSBURGH

Per Gross ton, f.o.b. Pittsburgh district furnace:

| | |
|---|---|
| Basic | $14.00 |
| No. 2 foundry | 15.00 |
| No. 3 foundry | 14.50 |
| Malleable | 15.00 |
| Bessemer | 15.00 |

Freight rates to points in Pittsburgh district range from 65c. to $1.26.

### CHICAGO

Per gross ton at Chicago furnaces:

| | |
|---|---|
| N'th'n No. 2 fdy. | $15.50 |
| N'th'n No. 1 fdy. | 16.00 |
| Malleable, not over 2.25 sil. | 15.50 |
| High phosphorus | 15.50 |
| Lake Super. charcoal, sil. 1.50, by rail | 23.17 |
| Southern No. 2 fdy. | 16.14 |
| Low phos., sil. 1 to 2, Copper free. | 25.00 |
| Silvery, sil. 8 per cent. | 23.67 |
| Bess. ferrosil'n, 15 per cent. | 28.92 |

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnaces, not including a switching charge.

### St. LOUIS

Per gross ton at St. Louis:

| | |
|---|---|
| No. 2 fdy., sil. 1.75 to 2.25, f.o.b. Granite City, Ill. | $17.50 |
| Malleable, f.o.b. Granite City | 17.50 |
| Northern No. 2 fdy., del'd St. Louis | $17.80 to 18.30 |
| Southern No. 2 fdy. del'd. | 14.56 |
| Northern malleable, del'd. | 17.80 to 18.30 |
| Northern basic, del'd. | 17.80 to 18.30 |

Freight rates 83c. (average) Granite City to St. Louis; $2.30 from Chicago; $4.56 from Birmingham.

### NEW YORK

Per gross ton, delivered New York district:

| | |
|---|---|
| * Buffalo, No. 2, del'd east N. J. | $17.41 to $17.66 |
| East Pa. No. 2 fdy. | 14.02 |
| East Pa. No. 2X fdy. | 14.52 |

Freight rates: $1.52 to $2.63 from eastern Pennsylvania.

* Prices delivered to New Jersey cities having rate of $3.41 a ton from Buffalo.

### BUFFALO

Per gross ton, f.o.b. furnace:

| | |
|---|---|
| No. 2 fdy. | $16.00 |
| No. 2X fdy. | 16.50 |
| No. 1 fdy. | 17.50 |
| Malleable, sil. up to 2.25 | 16.50 |
| Basic | 15.50 |
| Lake Superior charcoal, del'd | 23.41 |

### CINCINNATI

Per gross ton, delivered Cincinnati:

| | |
|---|---|
| Ala. fdy., sil. 1.75 to 2.25 | $13.82 |
| Ala. fdy., sil. 2.25 to 2.75 | 14.32 |
| Tenn. fdy., sil. 1.75 to 2.25 | 13.82 |
| N'th'n No. 2 foundry | $17.01 to 17.59 |
| S'th'n Ohio silvery, 8% | 21.02 |

Freight rates, $2.02 from Ironton and Jackson, Ohio; $3.82 from Birmingham.

### CLEVELAND

Per gross ton at Cleveland furnace:

| | |
|---|---|
| N'th'n No. 2 fdy. (local delivery) | $15.00 |
| S'th'n fdy. sil. 1.75 to 2.25 | 16.14 |
| Malleable (local delivery) | 15.00 |
| Ohio silvery, 8 per cent. | 21.87 |
| Stand. low. phos., Valley | 23.00 |

Prices are f.o.b. furnace except on Southern foundry and silvery iron. Freight rates: 63c. average local switching charge; $3.12 from Jackson, Ohio: $6.14 from Birmingham.

### PHILADELPHIA

Per gross ton at Philadelphia:

| | |
|---|---|
| East. Pa. No. 2 | $13.34 to $13.84 |
| East. Pa. No. 2X | 13.84 to 14.34 |
| East. Pa. No. IX | 14.34 to 14.84 |
| Basic (del'd east. Pa.) | 13.50 to 14.00 |
| Malleable | 14.74 to 18.04 |
| Stand. low phos. (f.o.b. east. Pa. furnace) | 20.00 to 21.00 |
| Cop. b'r'g low phos. (f.o.b. furnace) | 20.00 to 21.00 |
| Va. No. 2 | 21.79 |
| Va. No. 2X | 22.29 |

Prices, except as specified otherwise, are del'd Philadelphia. Freight rates: 84c. to $1.79 from eastern Pennsylvania furnaces; $4.67 from Virginia furnaces.

### BIRMINGHAM

Per gross ton, f.o.b. Birmingham dist. furnace:

| | |
|---|---|
| No. 2 fdy., 1.75 to 2.25 sil. | $11.00 |
| No. 2 soft, 2.25 to 2.75 sil. | 11.50 |
| Basic | 11.00 |

### NEW ENGLAND

Per gross ton delivered to most New England points:

| | |
|---|---|
| *Buffalo, sil. 1.75 to 2.25 | $19.05 |
| *Buffalo, sil. 2.25 to 2.75 | 19.05 |
| †Buffalo, sil. 1.75 to 2.25 | 17.41 |
| †Buffalo, sil. 2.25 to 2.75 | 17.41 |
| †Ala., sil. 1.75 to 2.25 | 15.64 |
| †Ala., sil. 2.25 to 2.75 | 16.14 |

Freight rates: $5.05 all rail from Buffalo, and $3.41 to $3.91 rail and water from Buffalo when $1 barge and $2 to $2.50 New England freight rate are obtainable; $5.64 rail and water from Alabama to New England seaboard.

* All-rail rate.

† Rail-and-water rate.

### CANADA

Per gross ton:

| | |
|---|---|
| Delivered Toronto | |
| No. 1 fdy., sil. 2.25 to 2.75 | $22.60 |
| No. 2 fdy., sil. 1.75 to 2.75 | 22.10 |
| Malleable | 22.60 |
| Delivered Montreal | |
| No. 1 fdy., sil. 2.25 to 2.75 | $24.00 |
| No. 2 fdy., sil. 1.75 to 2.25 | 23.50 |
| Malleable | 24.00 |
| Basic | $23.00 to 23.50 |

### Ferromanganese

| | Per Gross Ton |
|---|---|
| Domestic, 80%, seaboard | *$68.00 |
| Foreign, 80%, Atlantic or Gulf port, duty paid | 61.00 |

*Contract price; spot quotation $61.

Prices for lots of one carload or more; extras applied on less than carload lots.

### Spiegeleisen

| | Per Gross Ton Furnace |
|---|---|
| Domestic, 19 to 21% | $24.00 |

### Electric Ferrosilicon

| | Per Gross Ton Delivered |
|---|---|
| 50% (carloads) | $74.50 |
| 50% (less carloads) | 82.00 |
| 75% (carloads) | 120.00 |
| 75% (less carloads) | 130.00 |
| 14% to 16% (f.ob.) Weland, Ont. (in carloads) | 31.00 |
| 14% to 16% (less carloads) | 36.00 |

### Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace

| Per Gross Ton | | Per Gross Ton | |
|---|---|---|---|
| 10% | $20.50 | 14% | $23.50 |
| 11% | 21.00 | 15% | 24.00 |
| 12% | 21.50 | 16% | 25.00 |
| 13% | 22.50 | 17% | 26.50 |

### Silvery Iron

F.o.b. Jackson County, Ohio, Furnace

| Per Gross Ton | | Per Gross Ton | |
|---|---|---|---|
| 6% | $18.00 | 12% | $20.50 |
| 7% | 18.50 | 13% | 21.50 |
| 8% | 18.75 | 14% | 22.50 |
| 9% | 19.00 | 15% | 23.00 |
| 10% | 19.50 | 16% | 24.00 |
| 11% | 20.00 | 17% | 25.50 |

### Other Ferroalloys

| | |
|---|---|
| Ferrotungsten, per lb. wo. del., carloads | 94c. |
| Ferrotungsten, less carloads | $1.00 |
| Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads | 9.5c. |
| Ferrochromium, 2% carbon | 16.50c. to 17.0c. |
| Ferrochromium, 1% carbon | 17.50c. to 18.0c. |
| Ferrochromium, 0.10% carbon | 19.50c. to 20.0c. |
| Ferrochromium, 0.06% carbon | 20.00c. to 20.5c. |
| Ferrovanadium, del., per lb. contained Va. | $2.60 to $2.80 |
| Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace in carloads | 160.00 |
| Ferrophosphorus, electric, or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton with $2 unitage | 50.00 |
| Ferrophosphorus, electric, 24% f.o.b. Anniston, Ala., per gross ton with $2.75 unitage | 65.00 |
| Ferromolybdenum, per lb. Mo., del. | 90c. |
| Calcium molybdate, per lb. Mo., del. | 80c. |
| Silico spiegel, per ton, f.o.b. furnace, car lots | $36.00 |
| Ton lots or less, per ton | 41.00 |
| Silico-managanese, gross ton, delivered: | |
| 2.50% carbon grade | 85.00 |
| 2% carbon grade | 90.00 |
| 1% carbon grade | 100.00 |
| Spot prices | $5 a ton higher |

### Ores

*Lake Superior Ores, Delivered Lower Lake Ports*

| | Per Gross Ton |
|---|---|
| Old range Bessemer, 51.5% iron | $4.10 |
| Old range, non-Bessemer, 51.50% iron | 4.05 |
| Mesabi Bessemer, 51.50% iron | 4.05 |
| Mesabi non-Bessemer, 51.50% iron | 4.00 |
| High phosphorous, 51.50% iron | 4.00 |

*Foreign Ore, c.i.f. Philadelphia or Baltimore*

| | Per Unit |
|---|---|
| Iron, low phos., copper free, 55 to 58% iron, dry Spanish or Algerian | 8c. to 8.50c. |
| Iron, low phos., Swedish, average 68½% iron | 9c. |
| Iron, basic or foundry, Swedish, average, 65% iron | 8c. |
| Iron, basic or foundry, Russian, aver. 63% iron (nom.) | 9c. |
| Manganese, Caucasian, washed 52% | *20c. |
| Manganese, African, Indian, 50-52% | *21c. to 22c. |
| Manganese, Brazilian, 46 to 48% | *13c. |

| | Per Net Ton Unit |
|---|---|
| Tungsten, Chinese wolframite, duty paid | $10.00 |

| | Per Gross Ton |
|---|---|
| Tungsten, domestic scheelite | $8.00 to $10.00 |
| Chrome, 45% $Cr_2O_3$, crude, c.i.f. Atlantic seaboard | 16.00 |
| Chrome, 48% $Cr_2O_3$, c.i.f. Atlantic seaboard | 18.00 |

*Quotations nominal in absence of sales.

### Fluorspar

| | Per Net Ton |
|---|---|
| Domestic, washed gravel 85-5, f.o.b. Kentucky and Illinois mines | $9.00 to 9.50 |
| No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines | $11.00 to 11.50 |
| Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic port, duty paid | $16.00 to 16.75 |
| Domestic, No. 1 ground bulk, 85 to 98% calcium, fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines | 20.00 |

# Iron and Steel Scrap

### PITTSBURGH

Per gross ton delivered consumers' yards:

| | |
|---|---|
| No. 1 heavy melting steel | $8.00 to $9.00 |
| No. 2 heavy melting steel | 7.25 to 7.75 |
| No. 2 railroad wrought | 8.50 9.00 |
| Scrap rails | 8.50 to 9.00 |
| Rails 3 ft. and under | 10.00 to 10.50 |
| Sheet bar crops, ordinary | 9.00 to 9.50 |
| Compressed sheet steel | 8.25 to 8.75 |
| Hand bundled sheet steel | 7.25 to 7.75 |
| Hvy steel axle turnings | 7.00 to 7.50 |
| Machine shop turnings | 6.25 to 6.75 |
| Short shov. steel turnings | 6.25 to 6.75 |
| Short mixed borings and turnings | 5.50 to 6.00 |
| Cast iron borings | 5.50 to 6.00 |
| Cast iron carwheels | 8.00 to 8.50 |
| Heavy breakable cast | 8.00 to 8.50 |
| No. 1 cast | 8.50 to 9.50 |
| Railr. knuckles and couplers | 9.00 to 10.00 |
| Rail, coil and leaf springs | 9.00 to 10.00 |
| Rolled steel wheels | 9.00 to 10.00 |
| Low phos. billet crops | 10.50 to 11.00 |
| Low phos. sheet bar crops | 10.50 to 11.00 |
| Low phos. plate scrap | 9.50 to 10.00 |
| Low phos. punchings | 10.00 to 10.50 |
| Steel car axles | 10.00 to 10.50 |

### CHICAGO

Delivered Chicago district consumers:

| | Per Gross Ton |
|---|---|
| Heavy melting steel | $5.00 to $5.50 |
| Shoveling steel | 5.00 to 5.50 |
| Frogs, switches and guards | 5.00 to $5.50 |
| Hydraulic comp. sheets | 4.00 to 4.50 |
| Drop forge flashings | 4.00 to 4.50 |
| No. 1 busheling | 3.50 to 4.00 |
| Rolled carwheels | 7.00 to 7.50 |
| Railroad tires | 8.00 to 8.50 |
| Railroad leaf springs | 7.75 to 8.25 |
| Axle turnings | 4.50 to 5.00 |
| Steel couplers and knuckles | 7.00 to 7.50 |
| Coil springs | 8.25 to 8.75 |
| Axle turnings (elec. fur.) | 5.50 to 6.00 |
| Low phos. punchings | 8.00 to 8.50 |
| Low phos. plates, 12 in. and under | 8.00 to 8.50 |
| Cast iron borings | 3.25 to 3.75 |
| Short shoveling turnings | 3.25 to 3.75 |
| Machine shop turnings | 3.00 to 3.50 |
| Rerolling rails | 7.50 to 8.00 |
| Steel rails, less than 3 ft. | 7.50 to 8.00 |
| Steel rails, less than 2 ft. | 8.00 to 8.50 |
| Angle bars, steel | 7.00 to 7.50 |
| Cast iron carwheels | 8.00 to 8.50 |
| Railroad malleable | 5.50 to 6.00 |
| Agricultural malleable | 5.00 to 5.50 |
| * Relaying rails, 56 to 60 lb. | 15.00 to 17.00 |
| * Relay. rails, 65 lb. and up | 18.00 to 23.00 |

| | Per Net Ton |
|---|---|
| Iron angle and splice bars | $5.00 to $5.50 |
| Iron arch bars, transoms | 5.00 to 5.50 |
| Iron car axles | 11.00 to 11.50 |
| Steel car axles | 8.50 to 9.00 |
| No. 1 railroad wrought | 4.50 to 5.00 |
| No. 2 railroad wrought | 4.50 to 5.00 |
| No. 1 busheling | 2.50 to 3.00 |

| | | |
|---|---|---|
| No. 2 busheling | $2.00 to | $2.50 |
| Locomotive tires, smooth | 7.50 to | 8.50 |
| Pipe and flues | 1.25 to | 1.75 |
| No. 1 machinery cast | 6.25 to | 6.75 |
| Clean automobile cast | 7.25 to | 7.75 |
| No. 1 railroad cast | 5.75 to | 6.25 |
| No. 1 agricultural cast | 5.75 to | 6.25 |
| Stove plate | 5.50 to | 6.00 |
| Grate bars | 6.25 to | 6.75 |
| Brake shoes | 6.00 to | 6.50 |

* Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

### PHILADELPHIA

Per gross ton delivered consumers' yards:

| | | |
|---|---|---|
| No. 1 heavy melting steel | $6.50 to | $7.00 |
| No. 2 heavy melting steel | 5.00 to | 5.50 |
| No. 1 railroad wrought | 7.50 to | 8.00 |
| Bundled sheets | 4.00 to | 4.50 |
| Hydraulic compressed, new | 5.50 to | 6.00 |
| Hydraulic compressed, old | 4.00 to | 4.50 |
| Machine shop turnings | 3.50 to | 4.00 |
| Heavy axle turnings | 5.50 to | 6.00 |
| Cast borings | 3.50 to | 3.75 |
| Heavy breakable cast | | 8.00 |
| Stove plate (steel works) | 5.50 to | 6.00 |
| No. 1 low phos. heavy | 10.00 to | 10.50 |
| Couplers and knuckles | 8.00 to | 8.50 |
| Rolled steel wheels | 8.00 to | 8.50 |
| No. 1 blast furnace | 3.50 to | 3.75 |
| Spec. iron and steel pipe | 6.50 to | 7.00 |
| Shafting | 12.00 to | 13.00 |
| Steel axles | 12.00 to | 13.00 |
| No. 1 forge fire | 5.50 to | 6.00 |
| Cast iron carwheels | 8.00 to | 8.50 |
| No. 1 cast | 8.00 to | 9.00 |
| Cast borings (chem.) | 8.00 to | 10.00 |
| Steel rails for rolling | 9.00 to | 9.50 |

### CLEVELAND

Per gross ton delivered consumers' yards:

| | | |
|---|---|---|
| No. 1 heavy melting steel | $7.00 to | $7.25 |
| No. 2 heavy melting steel | 6.25 to | 6.50 |
| Compressed sheet steel | 6.00 to | 6.50 |
| Light bundled sheet stampings | 4.00 to | 4.50 |
| Drop forge flashings | 5.25 to | 5.75 |
| Machine shop turnings | 3.50 to | 3.75 |
| Short shoveling turnings | 3.75 to | 4.25 |
| No. 1 busheling | 5.25 to | 5.50 |
| Steel axle turnings | 5.00 to | 5.50 |
| Low phos., billet crops | 10.00 to | 11.00 |
| Cast iron borings | 3.75 to | 4.25 |
| Mixed borings and short turnings | 3.75 to | 4.25 |
| No. 2 busheling | 4.50 to | 4.75 |
| No. 1 cast | 7.00 to | 7.50 |
| Railroad grate bars | 5.00 to | 5.50 |
| Stove plate | 5.00 to | 5.50 |
| Rails under 3 ft. | 8.50 to | 9.00 |
| Rails for rolling | 8.50 to | 9.00 |
| Railroad malleable | 6.75 to | 7.00 |
| Cast iron carwheels | | 8.00 |

### BUFFALO

Per gross ton, f.o.b. Buffalo consumers' plants:

| | | |
|---|---|---|
| No. 1 heavy melting steel | $7.00 to | $7.25 |
| No. 2 heavy melting scrap | 5.50 to | 6.00 |
| Scrap rails | 6.00 to | 6.50 |
| New hydraul. comp. sheets | 5.50 to | 6.00 |
| Old hydraul. comp. sheets | | 5.00 |
| Drop forge flashings | 5.50 to | 6.00 |
| No. 1 busheling | 5.50 to | 6.00 |
| Hvy. steel axle turnings | | 6.00 |
| Machine shop turnings | 4.00 to | 4.50 |
| Knuckles and couplers | | 9.00 |
| Coil and leaf springs | | 9.00 |
| Rolled steel wheels | | 9.00 |
| Low phos. billet crops | 9.00 to | 9.50 |
| Short shov. steel turnings | 5.50 to | 6.00 |
| Short mixed borings and turnings | 3.75 to | 4.25 |
| Cast iron borings | 3.75 to | 4.25 |
| No. 2 busheling | 3.50 to | 4.00 |
| Steel car axles | 10.00 to | 11.00 |
| Iron axles | 10.00 to | 11.00 |
| No. 1 machinery cast | 9.50 to | 10.00 |
| No. 1 cupola cast | 8.50 to | 9.00 |
| Stove plate | 7.00 to | 7.50 |
| Steel rails, 3 ft. and under | 8.50 to | 9.00 |
| Cast iron carwheels | 8.00 to | 9.00 |
| Industrial malleable | 7.00 to | 7.50 |
| Railroad malleable | 7.00 to | 7.50 |
| Chemical borings | 7.50 to | 8.00 |

### BIRMINGHAM

Per gross ton delivered consumers' yards:

| | | |
|---|---|---|
| Heavy melting steel | $7.00 to | $7.50 |
| Scrap steel rails | 7.00 to | 7.50 |
| Short shoveling turnings | | 4.00 |
| Stove plate | | 6.00 |
| Steel axles | | 9.00 |
| Iron axles | | 9.00 |
| No. 1 railroad wrought | 4.50 to | 5.00 |
| Rails for rolling | 7.50 to | 8.00 |
| No. 1 cast | | 8.50 |
| Tramcar wheels | | 8.50 |
| Cast iron borings, chem. | | 8.50 |

### ST. LOUIS

Per gross ton delivered consumers' yards:

| | | |
|---|---|---|
| Selected heavy steel | $5.50 to | $6.00 |
| No. 1 heavy melting | 4.50 to | 5.00 |
| No. 2 heavy melting | 4.75 to | 5.25 |
| No. 1 locomotive tires | 5.00 to | 5.50 |
| Misc. stand-sec. rails | 5.50 to | 6.00 |
| Railroad springs | 6.00 to | 6.50 |
| Bundled sheets | 2.00 to | 2.50 |
| No. 1 railroad wrought | 5.00 to | 5.50 |
| No. 1 busheling | 3.50 to | 4.00 |
| Cast iron borings and shoveling turnings | 2.75 to | 3.25 |
| Rails for rolling | 6.75 to | 7.25 |
| Machine shop turnings | 2.00 to | 2.50 |
| Heavy turnings | 3.00 to | 3.50 |
| Steel car axles | 8.50 to | 9.00 |
| Iron car axles | 11.00 to | 11.50 |
| Wrot. iron bars and trans. | 4.00 to | 4.50 |
| No. 1 railroad wrought | 3.50 to | 4.00 |
| Steel rails less than 3 ft. | 7.00 to | 7.50 |
| Steel angle bars | 6.00 to | 6.50 |
| Cast iron carwheels | 5.00 to | 5.50 |
| No. 1 machinery cast | 6.50 to | 7.00 |
| Railroad malleable | 4.00 to | 4.50 |
| No. 1 railroad cast | 6.25 to | 6.75 |
| Stove plate | 6.00 to | 6.50 |
| Relay, rails, 60 lb. and under | 16.00 to | 16.50 |
| Relay, rails, 60 lb. and over | $20.00 to | $21.00 |
| Agricult. malleable | 4.00 to | 4.50 |

### BOSTON

Dealer's buying prices per gross ton:

| | | |
|---|---|---|
| No. 1 heavy melting steel | $3.00 to | $3.25 |
| Scrap T rails | 2.50 to | 2.75 |
| Machine shop turnings | 0.80 to | 1.00 |
| Cast iron borings | | 1.05 |
| Bundled skeleton, long | 2.00 to | 2.10 |
| Forge flashings | 3.00 to | 3.50 |
| Blast furnace scrap | 0.90 to | 1.00 |
| Forge scrap | 3.00 to | 3.25 |
| Shafting | 9.50 to | 10.00 |
| Steel car axles | 9.00 to | 9.50 |
| Wrought pipe | 4.00 to | 4.25 |
| Rails for rolling | 4.50 to | 5.00 |
| Cast iron borings, chemical | 7.00 to | 7.25 |
| Per gross ton delivered consumers' yards: | | |
| Textile cast | $7.00 to | $7.50 |
| No. 1 machinery cast | 7.50 to | 8.00 |
| Stove plate | 5.00 to | 5.25 |
| Railroad malleable | 8.00 to | 8.50 |

### NEW YORK

Dealers' buying prices per gross ton:

| | | |
|---|---|---|
| No. 1 heavy melting steel | $3.50 to | $5.00 |
| No. 2 heavy melting steel | 3.50 to | 4.00 |
| Heavy melting steel (yard) | | 1.50 |
| No. 1 heavy breakable cast | 5.00 to | 5.25 |
| Stove plate (steel works) | 2.50 to | 2.90 |
| Machine shop turnings | 0.75 to | 1.25 |
| Short shoveling turnings | 0.75 to | 1.25 |
| Cast borings | 0.50 to | 1.00 |
| No. 1 blast furnace | 0.50 to | 1.00 |
| Steel car axles | 8.00 to | 8.50 |
| Spec. iron and steel pipe | $2.50 to | $2.75 |
| Forge fire | 2.75 to | 3.00 |
| No. 1 railroad wrought | 4.00 to | 4.50 |
| No. 1 yard wrought long | 3.25 to | 3.50 |
| Rails for rolling | 5.00 to | 5.50 |
| No. 1 cast | | 4.50 |
| No. 2 cast | | 4.50 |
| Stove plate (foundry) | | 4.50 |
| Malleable cast (railroad) | 4.00 to | 4.50 |
| Cast borings (chemical) | 6.00 to | 6.50 |
| Per gross ton, delivered local foundries: | | |
| No. 1 machinery cast | | $9.00 |
| No. 1 hvy. cast (cupola size) | 7.50 to | 8.00 |
| No. 2 cast | 4.00 to | 4.50 |

### CINCINNATI

Dealers' buying prices per gross ton:

| | | |
|---|---|---|
| Heavy melting steel | $5.00 to | $5.50 |
| Scrap rails for melting | 6.00 to | 6.50 |
| Loose sheet clippings | 1.00 to | 1.50 |
| Bundled sheets | 3.75 to | 4.25 |
| Cast iron borings | 3.00 to | 3.50 |
| Machine shop turnings | 3.00 to | 3.50 |
| No. 1 busheling | 4.50 to | 5.00 |
| No. 2 busheling | 2.75 to | 3.25 |
| Rails for rolling | 6.50 to | 7.00 |
| No. 1 locomotive tires | 7.00 to | 7.50 |
| Sheet rails | 9.00 to | 9.50 |
| Cast iron carwheels | 6.50 to | 7.00 |
| No. 1 machinery cast | 6.50 to | 7.00 |
| No. 1 railroad cast | 6.00 to | 6.50 |
| Burnt cast | 4.25 to | 4.75 |
| Stove plate | 4.25 to | 4.75 |
| Agricultural malleable | 6.75 to | 7.25 |
| Railroad malleable | 7.00 to | 7.50 |

### DETROIT

Dealers' buying prices per gross ton:

| | | |
|---|---|---|
| Hvy. melting steel | $4.50 to | $5.00 |
| Borings and short turnings | 2.50 to | 3.00 |
| Long turnings | 2.25 to | 2.75 |
| No. 1 machinery cast | 7.75 to | 8.25 |
| Automotive cast | 8.00 to | 8.50 |
| Hydraul. comp. sheets | 4.25 to | 4.75 |
| Stove plate | 3.00 to | 3.50 |
| New No. 1 busheling | 3.75 to | 4.25 |
| Old No. 2 busheling | 1.50 to | 2.00 |
| Sheet clippings | 1.25 to | 1.75 |
| Flashings | 2.75 to | 3.25 |

### CANADA

Dealers' buying prices per gross ton:

| | Toronto | Montreal |
|---|---|---|
| Heavy melting steel | $7.00 | $6.00 |
| Rails, scrap | 7.00 | 6.00 |
| No. 1 wrought | 6.00 | 8.00 |
| Machine shop turnings | 2.00 | 2.00 |
| Boiler plate | 5.00 | 4.50 |
| Heavy axle turnings | 2.50 | 2.50 |
| Cast borings | 2.00 | 2.00 |
| Steel borings | 2.00 | 2.00 |
| Wrought pipe | 2.00 | 2.00 |
| Steel axles | 7.00 | 9.00 |
| Axles, wrought iron | 7.00 | 11.00 |
| No. 1 machinery cast | 12.50 | 10.00 |
| Stove plate | 10.00 | 8.00 |
| Standard carwheels | 10.00 | 8.50 |
| Malleable | 10.00 | 8.00 |

# Warehouse Prices for Steel Products

### PITTSBURGH

| | Base per Lb. |
|---|---|
| Plates | 2.85c. |
| Structural shapes | 2.85c. |
| Soft steel bars and small shapes | 2.60c. |
| Reinforcing steel bars | 2.60c. |
| Cold-finished and screw stock— | |
| Rounds and hexagons | 2.95c. |
| Squares and flats | 3.45c. |
| Hoops and bands, under ¼ in. | 2.95c. |
| Hot-rolled annealed sheets (No. 24), 25 or more bundles | 3.10c. |
| Galv. sheets (No. 24), 25 or more bundles | 3.35c. |
| Hot-rolled sheets (No. 10) | 2.65c. |
| Galv. corrug. sheets (No. 28), per square (less than 3750 lb.) | $3.61 |
| Spikes, large | 2.40c. |
| Small | 2.65c. |
| Boat | 2.90c. |
| Track bolts, all sizes, per 100 count, | 70 per cent off list. |
| Machine bolts, 100 count, | 70 per cent off list. |
| Carriage bolts, 100 count, | 70 per cent off list. |
| Nuts, all styles, 100 count, | 70 per cent off list. |
| Large rivets, base per 100 lb. | $3.00 |
| Wire, black, soft ann'l'd base per 100 lb. | 2.65 |
| Wire, galv. soft, base per 100 lb. | 3.10 |
| Common wire nails, per keg | 2.20 |
| Cement coated nails, per keg | 2.20 |

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applied to orders of 400 to 999 lb.

### CHICAGO

| | Base per Lb. |
|---|---|
| Plates and structural shapes | 3.00c. |
| Soft steel bars | 2.75c. |
| Reinforc. bars, billet steel | 1.55c. to 1.70c. |
| Rail steel reinforcement | 1.30c. to 1.45c. |
| Cold-fin. steel bars and shafting | |
| Rounds and hexagons | 3.00c. |
| Flats and squared | 3.50c. |
| Bands, 3/16 in. (in Nos. 10 and 12 gages) | 2.95c. |
| Hoops (No. 14 gage and lighter) | 3.50c. |
| Hot-rolled annealed sheets (No. 24) | 3.45c. |
| Galv. sheets (No. 24) | 3.50c. |
| Hot-rolled sheets (No. 10) | 3.20c. |
| Spikes (3/16 in. and lighter) | 3.45c. |
| Track bolts | 4.30c. |
| Rivets, structural (keg lots) | 2.75c. |
| Rivets, boiler (keg lots) | 2.75c. |
| | Per Cent Off List |
| Machine bolts | 65 |
| Carriage bolts | 65 |
| Coach and lag screws | 65 |
| Hot-pressed nuts, sq., tap. or blank | 65 |
| Hot-pressed nuts, hex., tap. or blank | 65 |
| Hex. head cap screws | 80 and 10 |
| Cup point set screws | 75 |
| Flat head bright wood screws | 50 and 10 |
| Spring cotters | 60 and 10 |
| Stove bolts | 80 |
| Rd. hd. tank rivets, 7/16 in. and smaller | 65 |
| Wrought washers | $4.50 off list |
| No. 8 black ann'l'd wire, per 100 lb. | $3.45 |
| Com. wire nails, base per keg | 2.30 |
| Cement c't'd nails, base per keg | 2.30 |

### NEW YORK

| | Base per Lb. |
|---|---|
| Plates and struc. shapes | 3.10c. |
| Soft steel bars, small shapes | 3.10c. |
| Iron bars | 3.24c. |
| Iron bars, Swed. charcoal | 5.90c. to 6.25c. |
| Cold-fin. shafting and screw stock; | |
| Rounds and hexagons | 3.54c. |
| Flats and squares | 4.04c. |
| Cold-roll. strip, soft and quarter hard | 4.95c. |
| Hoops | 3.30c. |
| Bands | 3.30c. |
| Hot-rolled sheets (No. 10) | 3.00c. |
| Hot-rolled ann'l'd sheets (No. 24*) | 3.25c. |
| Galvanized sheets (No. 24*) | 3.75c. |
| Long terne sheets (No. 24) | 4.50c. |
| Standard tool steel | 12.00c. |
| Wire, black annealed (No. 10) | 3.60c. |
| Wire, galv. annealed (No. 10) | 4.05c. |
| Tire steel ½ x ¼ in. and larger | 3.40c. |
| Smooth finish, 1 to 2½ x ¼ in. and larger | 3.75c. |
| Open-hearth spring steel, bases | 4.50c. to 7.00c. |
| Common wire nails, base, per keg | $2.60 |
| | Per Cent |
| Machine bolt, cut thread: | Off List |
| ¾ x 6 in. and smaller | 65 to 65 and 10 |
| 1 x 30 in. and smaller | 65 to 65 and 10 |
| Carriage bolts, cut thread: | |
| ½ x 6 in. and smaller | 65 to 65 and 10 |
| ¾ x 20 in. and smaller | 65 to 65 and 10 |
| Boiler tubes: | Per 100 Ft. |
| Lap welded, 2-in. | $18.05 |
| Seamless welded, 2-in. | 19.24 |
| Charcoal iron, 2-in. | 24.94 |
| Charcoal iron, 4-in. | 63.65 |

* No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

### ST. LOUIS

| | Base per Lb. |
|---|---|
| Plates and struc. shapes | 3.25c. |
| Bars, soft steel or iron | 3.00c. |
| Cold-fin. rounds, shafting, screw stock | 3.36c. |
| Hot-rolled annealed sheets (No. 24) | 3.70c. |
| Galv. sheets (No. 24) | 4.00c. |
| Hot-rolled sheets (No. 10 up to and inc. 48 in. wide | 3.00c. |
| over 48 in. wide | 3.15c. |
| Black corrug. sheets (No. 24) | 3.75c. |
| Gal. corrug. sheets | 4.05c. |
| Structural rivets | 4.00c. |
| Boiler rivets | 4.00c. |
| | Per Cent Off List |
| Tank rivets, 7/16 in. and smaller, 100 lb. or more | 65 |
| Less than 100 lb. | 60 |
| Machine bolts | 65 |
| Carriage bolts | 65 |
| Lag screws | 65 |
| Hot-pressed nuts, sq., blank or tapped, 200 lb. or more | 65 |
| Less than 200 lb. | 55 |
| Hot-pressed nuts, hex., blank or tapped, 200 lb. or more | 65 |
| Less than 200 lb. | 55 |

### PHILADELPHIA

| | Base per Lb. |
|---|---|
| *Plates, ¼-in. and heavier | 2.45c. |
| *Structural shapes | 2.45c. |
| *Soft steel bars, small shapes, iron bars (except bands) | 2.45c. |
| Reinforc. steel bars, sq., twisted and deform. | 2.30c. |
| Cold-finished steel bars | 3.35c. |
| *Steel hoops | 3.00c. |
| *Steel bands, No. 12 to 3/16 in., incl. | 2.75c. |
| Spring steel | 5.00c. |
| †Hot-rolled annealed sheets (No. 24) | 3.15c. |
| †Galvanized sheet (No. 24) | 3.50c. |
| *Hot-rolled annealed sheets (No. 10) | 2.70c. |
| Diam. pat. floor plates, ¼ in. | 5.00c. |
| Swedish iron bars | 5.60c. |

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars.

* Base prices subject to deductions on orders aggregating 4000 lb. or over.

†For 50 bundles or over.

### CLEVELAND

| | Base per Lb |
|---|---|
| Plates and struc. shapes | 2.95c. |
| Soft steel bars | 2.75c. |
| Reinforc. steel bars | 1.75c. to 1.95c. |
| Cold-fin. rounds and hex. | 2.95c. |
| Cold-fin. flats and sq. | 3.45c. |
| Flat rolled steel under ¼ in. | 3.00c. |
| Cold-finished strip | 5.55c. |
| Hot-rolled annealed sheets (No. 24) | 3.25c. |
| Galvanized sheets (No. 24) | 3.50c. |
| Hot-rolled sheets (No. 10) | 3.00c. |
| Black ann'l'd wire, per 100 lb. | $2.55 |
| No. 9 galv. wire, per 100 lb. | 2.90 |
| Com. wire nails, base per keg | 2.10 |

* Net base, including boxing and cutting to length.

### CINCINNATI

| | Base per Lb. |
|---|---|
| Plates and struc. shapes | 3.25c. |
| Bars, soft steel or iron | 3.00c. |
| New billet reinforc. bars | 3.00c. |
| Rails steel reinforc. bars | 3.00c. |
| Hoops | 3.90c. |
| Bands | 3.20c. |
| Cold-fin. rounds and hex. | 3.32c. |
| Squares and flats | 3.82c. |
| Hot-rolled annealed sheets (No. 24) | 3.75c. |
| Galv. sheets (No. 24) | 3.55c. |
| Hot-rolled sheets (No. 10) | 3.30c. |
| Structural rivets | 4.20c. |
| Small rivets | 60 per cent off list |
| No. 9 ann'l'd wire, per 100 lb. | $3.00 |
| Com. wire nails, base per keg (10 to 49 kegs) | 2.65 |
| Larger quantities | 2.50 |
| Cement c't'd nails, base 100-lb. keg | 2.95 |
| Chain, per 100 lb. | 10.25 |
| | Net per 100 Ft. |
| Seamless steel boiler tubes, 2-in. | $15.87 |
| 4-in. | 34.57 |
| Lap-welded steel boiler tubes, 2-in. | 15.12 |
| 4-in. | 32.96 |

### BUFFALO

| | Base per Lb. |
|---|---|
| Plates and struc. shapes | 3.25c. |
| Soft steel bars | .25c. |
| Reinforcing bars | 2.95c. |
| Cold-fin. flats and sq. | 3.50c. |
| Rounds and hex. | 3.00c. |
| Cold-rolled strip steel | 5.25c. |
| Hot-rolled annealed sheets (No. 24) | 3.70c. |
| Galv. sheets (No. 24) | 4.05c. |
| Bands | 3.30c. |
| Hoops | 3.95c. |
| Hot-rolled sheets (No. 10) | 3.45c. |
| Com. wire nails, base per keg | $2.60 |
| Black wire, base per 100 lb. | 3.25 |

### BOSTON

| | Per Lb. |
|---|---|
| *Beams, channels, angles, tees, zees | 3.00c. |
| *H beams and shapes | 3.00c. |
| *Plates—sheared, tank, and univ. mill, ¼ in. thick and heavier | 3.00c. |
| Floor plates, diamond pattern | 5.25c. |
| *Bar and bar shapes (mild steel) | 2.90c. |
| *Bands 3/16 in. thick and No. 12 ga. incl. | 3.40c. |
| Hoops, No. 14 ga. and lighter | 4.90c. to 5.40c. |
| *Half rounds, hf. ovals, ovals and bevels | 4.15c. |
| Tire steel, rd. edge 1⅛ x ¼ in. and larger | 4.50c. |
| Smaller sizes | 4.75c. |
| Cold-finished rounds and hexagons | 5.20c. |
| Cold-rolled strip steel | 4.10c. |
| Cold-finished squares and flats | 3.15c. |
| *Blue annealed sheets No. 10 ga. | 3.50c. |
| One pass cold-rolled sheets No. 24 ga. | 3.90c. |
| Blued stove pipe sheets No. 24 ga. | 4.00c. |
| Galvanized steel sheets No. 24 ga. | 5.00c. |
| Lead coated (long ternes) No. 24 ga. | |

* Base prices for 15,000 lb. orders, extras apply for smaller quantities.

### PACIFIC COAST

| | San Francisco | Los Angeles | Seattle |
|---|---|---|---|
| | Base per Lb | | |
| Plates and struc. shapes, ¼-in. and heavier | 3.15c. | 3.30c. | 3.60c. |
| Soft steel bars | 3.15c. | 3.30c. | 3.00c. |
| *Reinforcing bars | 3.00c. | 3.00c. | 3.00c. |
| Hot-rolled annealed sheets (No. 24) | 3.90c. | 4.20c. | 4.50c. |
| Hot - rolled sheets (No. 10) | 3.37½c. | 3.80c. | 3.80c. |
| Galv. sheets (No. 24) | 4.55c. | 4.50c. | 5.00c. |
| *Struc. rivets, ½ in. and larger, less than 100 lb. | 5.75c. | 6.00c. | 5.25c. |
| *Cold finished steel Rounds | 5.50c. | 5.50c. | 5.50c. |
| Squares and hexagons | 6.75c. | 6.75c. | 6.75c. |
| Flats | 7.25c. | 7.25c. | 7.25c. |
| Nails—base per keg | | | |
| less carload: | | | |
| Com. 4-60d. | $2.40 | $2.40 | $2.40 |
| 8, or 4-20d. | 2.40 | 2.40 | 2.40 |
| Finish 6 & 8d. | 2.40 | 2.40 | 2.40 |
| All others | 2.65 | 2.65 | 2.65 |

* Subject to deductions for quantity.

# PLANT EXPANSION AND EQUIPMENT BUYING

## NORTH ATLANTIC

**Michel Brewing Corpn.,** 122 Third Street, Brooklyn, has awarded general contract to Jansen Contracting Co., Brooklyn, for two-story addition for new bottling works. Cost about $80,000 with machinery. Company also has plans for expansion in brewing plant to cost over $450,000 with equipment. Alfred H. Eccles, 29-09 Bridge Plaza North, Long Island City, is architect. S. Rubel is president.

**Department of Sanitation,** Municipal Building, New York, has filed plans for one-story garbage and refuse destructor plant, 196 x 220 ft., at 401-27 West 215th Street. Cost about $700,000 with machinery. Frank S. Parker, 119 West Fifty-seventh Street, is consulting engineer.

**Signal Supply Officer,** Army Base, Brooklyn, asks bids until March 17 for 175,000 ft. cable (Circular 78).

**Gold Star Oil Burner Mfg. Co., Inc.,** Yonkers, N. Y., has been organized by Felix Sposito, Sr. and Jr., and Joseph Sposito, 150 Warburton Avenue, Yonkers, to manufacture oil burners and oil-burning equipment.

**Sinclair Refining Co.,** 45 Nassau Street, New York, is carrying out expansion and improvement program at oil refinery at Houston, Tex., to include additional equipment. Cost over $350,000. Contract has been let to Chicago Bridge & Iron Works, 1305 West 105th Street, Chicago, for four 80,000-bbl. steel tanks for Houston plant. Company will also build new steel tanks and make other improvements at refinery at Marcus Hook, Philadelphia. Cost about $150,000 with equipment.

**Quartermaster Supply Officer,** Army Base, Brooklyn, asks bids until March 13 for one air compressor, 6000 galvanized ash or water cans, padlocks and other supplies (Circular 115).

**Empire Research & Development Co.,** Albany, N. Y., has been organized, capital $75,000, by Gilbert D. Kelley, 865 Myrtle Avenue, Albany, and Walter Gardner, 39 Chiswell Street, Schenectady, N. Y., to manufacture special machinery for filling bottles, bottle caps, etc.

**Pan-American Petroleum & Transport Co.,** 122 East Forty-second Street, New York, is arranging a consolidation of affiliated companies with parent organization, including Mexican Petroleum Corpn., address noted, American Oil Co., American Building, Baltimore, and Lord Baltimore Filling Stations, Inc., last noted address. Consolidated organization plans erection of new oil refinery in East Brooklyn district, Baltimore, near present works of Mexican Petroleum Corpn. Cost over $1,500,000 with storage and distributing division, pipe lines, etc.

**Bakers' Machine & Motor Repair Corpn.,** 603 East Fourteenth Street, New York, has leased space in building at 100-2 Grand Street for new works.

**Superintendent of Lighthouses,** St. George, Staten Island, N. Y., asks bids until March 16 for 100 acetylene flashers (Proposal 42776).

**J. Lapelosa,** 171 Remsen Street, New Brunswick, N. J., manufacturer of paper makers' supplies, will take bids soon on general contract for new two-story plant, 60 x 125 ft. Cost about $35,000 with equipment. H. G. Bach, 63 Schureman Street, is architect.

**Pharma Chemical Co.,** 169-81 West Fifty-second Street, Bayonne, N. J., manufacturer of industrial chemicals, etc., plans rebuilding portion of plant destroyed by fire Feb. 28. Loss over $100,000 with equipment.

**United Radio & Electric Corpn.,** 500 Chancellor Avenue, Irvington, N. J., manufacturer of radio equipment and electrical specialties, has leased about 5000 sq. ft. floor space in building at 227 High Street for new plant.

**Peter Wendel & Sons, Inc.,** 171 Badger Avenue, Newark, manufacturer of commercial wagons, trucks, parts, etc., has asked new bids on general contract for one and one-half story addition, 100 x 300 ft. Cost over $50,000 with equipment. H. F. Clark, East Orange, N. J., is architect.

**National Oil Products Co.,** Essex Street, Harrison, N. J., has awarded general contract to Mahony-Troast Construction Co., 657 Main Avenue, Passaic, N. J., for four-story addition, 84 x 130 ft. Cost about $150,000 with machinery. Henry D. Scudder, Jr., 9 Clinton Street, Newark, is architect and engineer.

**Bureau of Supplies and Accounts,** Navy Department, Washington, asks bids until March 14 for aircraft fuel quantity gages (Schedule 9684) for Philadelphia Navy Yard.

**Board of Public Education,** Administration Building, Philadelphia, asks bids until March 13 for stainless steel tables, enameled iron closets, etc., for various schools. Edward Merchant is secretary and business manager.

**National Portland Cement Co.,** Brodhead, Pa., care of W. S. Barstow & Co., Reading, Pa., engineer, has asked bids on general contract for two buildings, including one-story mechanical shop, for initial units for cement mill at Brodhead, where about 200 acres was purchased several months ago. Later bids will be asked for main mill, bagging plant, power house and other buildings. Cost over $1,500,000. Company was organized last year and is headed by Robert H. Anderson, president, and Fred B. Franks, Sr., vice-president and general manager. Barstow company, engineer, has New York offices at 120 Wall Street.

**International Resistance Co.,** 2006 Chestnut Street, Philadelphia, manufacturer of radio equipment, radio resistors, parts, etc., has leased two floors in building at Twenty-first and Arch Streets for expansion.

**Board of Education,** City Hall, Buffalo, asks bids until March 14 for anchors, belt terminals, boiler tubes and other equipment for school service. James Storer is secretary.

**Doehler Die-Casting Co.,** Batavia, N. Y., is planning to concentrate production at plant at Toledo, Ohio, and will transfer local works, as well as branch plants at Brooklyn, N. Y., and Pottstown, Pa., to that location. Assembling works will be continued at the three places noted.

## SOUTH ATLANTIC

**Board of District Commissioners,** District Building, Washington, asks bids until March 17 for two portable gasoline-driven air compressors.

**Southern States Iron Roofing Co.,** Savannah, Ga., manufacturer of galvanized steel roofing, steel drums, etc., has leased building at 6541 Eastern Avenue, Baltimore, for branch plant. Plans are under way for addition to structure. E. J. Conroy will be in charge.

**Swift & Co.,** Union Stock Yards, Chicago, are planning addition to branch plant at Savannah, Ga., including improvements in present unit. Cost about $55,000 with equipment.

**Construction Service,** Veterans' Administration, Washington, asks bids until April 18 for steel water tank and tower, refrigerating and ice-making machinery, water softening equipment, incinerator plant, electrical distributing system and other equipment for new buildings and utilities at Roanoke, Va., for which bids on general contract will be received at same time.

**General Purchasing Officer,** Panama Canal, Washington, asks bids until March 20 for industrial tractors, manganese steel wheels, dipper tooth points, cast iron straight edge, turnbuckles, grommets, brass screws, wire cloth, tackle block, cable clips, butt hinges and other mechanical supplies (Schedule 2846).

**Sun Oil Co.,** 1608 Walnut Street, Philadelphia, let general contract to Hughes-Foulkrod Co., Schaff Building, city, for new bulk oil storage and distributing plant on 4-acre tract at Baltimore. Cost over $65,000 with tanks and equipment.

**Bureau of Yards and Docks,** Navy Department, Washington, asks bids until April 5 for three-story addition to equipment storage and distributing building at navy yard, Pearl Harbor, T. H. (Specification 7085).

**Division of Purchases and Sales,** Department of Commerce, Washington, asks bids until March 17 for 80 to 200 steel towers with tower base insulators (Proposal 25130).

**Bassett Furniture Co.,** Bassett, Va., is considering new steam-electric power plant, cost over $45,000 with equipment. Company has work under way on three-story unit, 130 x 240 ft., to replace factory recently destroyed by fire and will carry out other expansion, including two top stories to present one-story building, 100 x 300 ft. Cost over $85,000.

**Bureau of Supplies and Accounts,** Navy Department, Washington, asks bids until March 14 for one motor-driven engine lathe (Schedule 9678), one putty mixer machine (Schedule 9692), two motor-driven precision toolmakers' lathes (Schedule 9688), four electric-operated fuel oil pumps and spare parts (Schedule 9698) for Eastern and Western Navy Yards; one motor-on-arbor type single end tenoner (Schedule 9691) for Norfolk Yard; one motor-driven centrifugal pump, without motor (Schedule 9681) for Sewalls Point, Va., yard; 760 combination file cleaners (Schedule 9662) for Philadelphia, Mare Island and Puget Sound yards; until March 21, 15,000 lb. steel welding electrodes for Philadelphia yard, 79,800 lb. iron welding electrodes for Brooklyn and Norfolk yards (Schedule 9690); composition pipe fittings (Schedule 9686) for Eastern and Western yards.

## NEW ENGLAND

**Harvard Brewing Co.,** Ayer district, Lowell, Mass., recently acquired by new interests, headed by Walter Blumenthal, of Hallgarten & Co., 44 Pine Street, New York, and associates, has plans by Waldemar Mortensen, 103 Park Avenue, New York, engineer, for expansion and improvements. List of new equipment is being arranged and bids are expected to be asked in 30 to 60 days. General contract for certain remodeling has been let to R. E. Runnels Construction Co., Lowell. Entire cost about $600,000. Mr. Blumenthal is treasurer; E. F. Lange is president.

**American Hide & Leather Co.,** 17 East Street, Boston, has plans for new power house at tanning plant, Lowell, Mass. Cost about $80,000 with equipment.

**Commanding Officer,** Springfield Armory, Springfield, Mass., asks bids until March 14 for two chain hoists, ¼-ton capacity (Circular 27).

**Amesbury Metal Products Co.,** Amesbury, Mass., recently formed by John J. O'Brien, 5 Estes Street, and associates, will operate at former plant of Aga Auto Lamp Co., Oakland Street, lately acquired. Company will manufacture automobile lighting equipment, vending machines, parts and other mechanical products.

**Connecticut Yacht Service, Inc.,** Southfield Avenue, Stamford, Conn., operating a boat-building and repair works, will build one-story shop addition, 21 x 50 ft.

## CENTRAL DISTRICT

**Pittsburgh Generator Co.,** Erie Street, McKeesport, Pa., manufacturer of acetylene gas and equipment, has plans for one-story addition. Work will be carried out by day labor. Contract for steel tanks has been let to Reliance Steel Products Co., Rankin, Pa. Cost over $40,000 with equipment.

**City Council,** Martinsburg, W. Va., is arranging financing for erection of a municipal electric light and power plant. Cost over $75,000 with equipment. C. H. Dailey, mayor, is active in project.

**Apex Electrical Mfg. Co.,** 1067 East 152nd Street, Cleveland, manufacturer of electrical appliances and household equipment, has arranged for purchase of Laundryette Corpn., 5100 Superior Avenue, manufacturer of electric washing machines and parts, and will operate as a subsidiary.

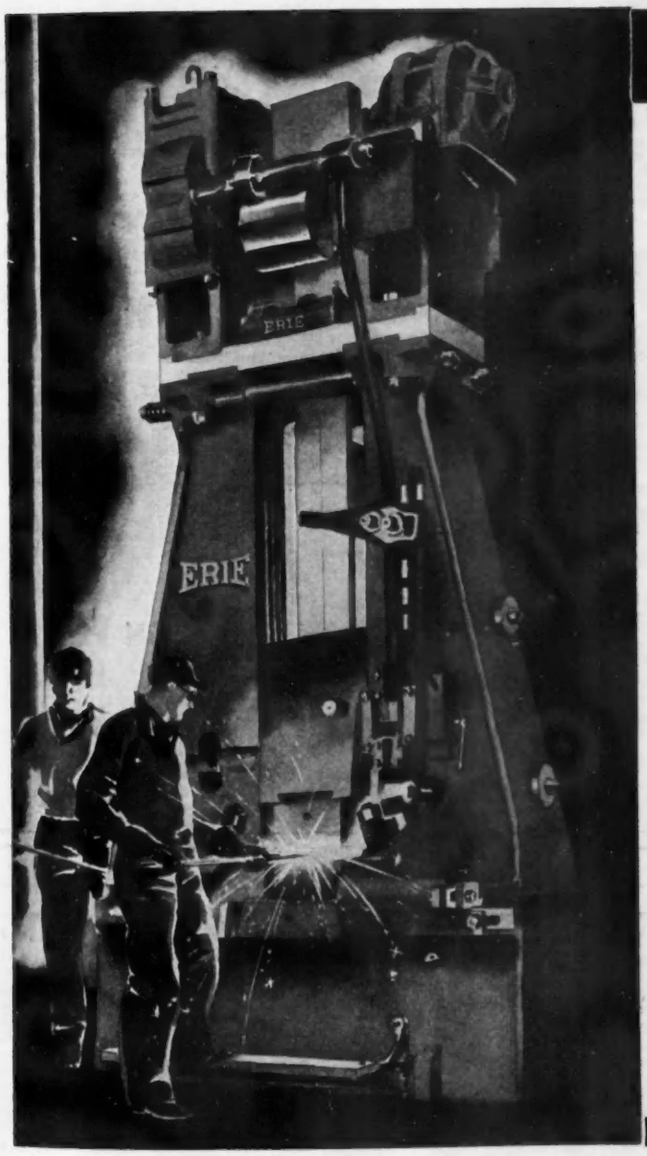
**Board of Public Works,** Youngstown, Ohio, is planning establishment of a municipal electric power plant, remodeling and expanding pumping station on West Avenue for such purpose. Federation of Improvement, Charles R. Hogg, president, has approved project.

**Wright's Welding Shop, Inc.,** Akron, Ohio, has been organized by J. B. Wright and Fred McClintock, care of Paul G. Russell, 1009 Akron Savings and Loan Building, representative, to operate a mechanical repair and welding works.

**E. I. du Pont de Nemours & Co.,** Wilmington, Del., through its subsidiary, Grasselli Chemical Co., 629 Euclid Avenue, Cleveland, has arranged for purchase of plant and business of Rex Research, Inc., Toledo, Ohio, manufacturer of spraying equipment, etc., in receivership for some time. Purchasing company will continue production of Rex spraying devices, parts, etc.

**M. & M. Screw Products Co.,** Cleveland, recently organized, has leased space in building at 1452 Devenport Avenue, N. E., and will

# The Last Handicap.... DEAD!




SEVERAL years ago the application of an electric motor to the board drop hammer released the board drop hammer from its fixed relation to and dependence upon line shafts, and made it a more economical hammer to install and to operate.

NOW Erie has removed the one remaining handicap of a fixed stroke by providing a variable stroke control giving the Erie board drop hammer the same flexibility of operation as the steam hammer. Light rapid blows or heavy blows at normal speeds are instantly obtainable. Adaptable to "drawing out" work as well as filling the die impressions.

If your hammers are old, even though they are in good condition, they carry severe handicaps which make profitable forging impossible. The year 1933 *demands* economy. Erie provides this economy in forging operations. Let us give you the facts and figures.

## ERIE FOUNDRY COMPANY

ERIE, PA., U. S. A.

STEAM DROP HAMMERS
BOARD DROP HAMMERS
FORGING AND TRIMMING PRESSES
SINGLE AND DOUBLE-FRAME HAMMERS

DETROIT: 335 CURTIS BLDG.
CHICAGO: 549 WASHINGTON BLVD.
INDIANAPOLIS: 335 POSTAL STATION BLDG.
PARIS, FRANCE: 6 RUE DE ROCROY

ERIE

begin operations at once. Richard Manning is president.

**Contracting Officer,** Material Division, Wright Field, Dayton, Ohio, asks bids until March 14 for 18,850 twist drills (Circular 438), 4300 drain cocks and 575 shut-off cocks (Circular 437); until March 13, one 5-ton electric hoist (Circular 441), 10 streamline wheel and casing assemblies (Circular 418); until March 15, 312 manifold pressure gate assemblies (Circular 416), 27,200 lubricators (Circular 413), aluminum, aluminum alloy, brass, copper and iron rivets (Circular 434), 600 single engine primer assemblies (Circular 440); until March 20, 36 dial test indicators (Circular 443).

**Dayton Street Railway Co.,** Realty Building, Dayton, Ohio, has filed plans for one-story car barn, 90 x 130 ft., with mechanical and inspection departments. Cost over $50,000 with equipment. Danis-Hunt Co., 1530 East First Street, is architect-engineer and contractor.

**Shell Petroleum Corpn.,** Union Trust Building, Cleveland, has plans for new bulk oil storage and distributing plant at Youngstown, Ohio. Cost over $35,000 with equipment. Main offices are in Shell Building, St. Louis.

**Department of Public Works,** Division of Highway Maintenance, City Hall, Cincinnati, C. E. Brokaw, superintendent, has plans for one-story repair shop on Bates Alley.

**Central States Bridge Co.,** 601 Beecher Street, Indianapolis, operating a structural steel fabricating works, is planning to rebuild one-story storage and distributing shop recently destroyed by fire. Loss about $40,000 with equipment.

**Numa-Paw Electric Works Corpn.,** Fort Wayne, Ind., has been organized by Paul Chamberlain and Bernard Bobay, Fort Wayne, to manufacture electric coils, transformers and kindred electrical equipment.

**Heath Aircraft Corpn.,** Niles, Mich., manufacturer of midget aircraft, parts, etc., has arranged for acquisition of Szekely Aircraft Engine Co., Holland, Mich., manufacturer of airplane engines and parts, and will carry out expansion. Heath company has also acquired Sky Harbor Airport, Chicago, and will operate as a subsidiary.

**Electrical Industrial Mfg. Corpn.,** Transportation Building, Detroit, has been organized by John Velcio, 6506 Superior Avenue, Cleveland, and associates, to manufacture industrial electrical appliances and equipment.

**Grand Rapids Metalcraft Corpn.,** Grand Rapids, Mich., manufacturer of automobile equipment, recently reorganized, has arranged for change of name to Valley City Metalcraft Corpn.

**Federal Screw Works,** 3401 Martin Street, Detroit, is carrying out development program at local plant and will concentrate on manufacture of complete line of screw machine products. Certain equipment will be transferred from branch plants at Lansing, Mich., and Cleveland to Detroit works.

**Village Council,** Leelanau, Mich., is planning erection of a municipal electric light and power plant. Cost about $50,000 with equipment.

## MIDDLE WEST

**Coates Steel Products Co.,** Greenville, Ill., manufacturer of steel grinding balls, grinding cylinders, etc., is planning one-story addition, primarily for a forge shop. Cost close to $25,000.

**Common Council,** Mount Carmel, Ill., has plans for extensions and improvements in municipal waterworks, to include installation of electric pumping machinery, 250,000 gal. elevated steel tank and tower, filtration and other equipment. Cost close to $100,000. Caldwell Engineering Co., Jacksonville, Ill., is consulting engineer.

**City Council,** Sioux Falls, S. D., asks bids until March 20 for equipment for a municipal electric light and power plant, including Diesel engine-generator unit and accessory equipment. Cost about $70,000 with machinery. Pillsbury Engineering Co., 1200 Second Avenue South, Minneapolis, is consulting engineer.

**Board of Education,** Glenwood, Ill., is planning to rebuild part of manual training school destroyed by fire Feb. 21. Loss about $100,000 with equipment.

**City Council,** Belleville, Ill., is completing surveys for a municipal electric light and power plant. Cost about $750,000 with equipment; also considering new municipal water plant and system, with electric pumping machinery, pipe lines and other equipment. Cost close to $1,500,000. Pearse, Greeley & Hanson, 6 North Michigan Avenue, Chicago, are consulting engineers; C. A. Heinzelman is city engineer.

**Lyle Culvert & Pipe Co.,** 171 Twenty-seventh Avenue, S. E., Minneapolis, manufacturer of metal culverts and other metal pipe, has awarded general contract to James Leck Co., 211 South Eleventh Street, for one-story addition, 40 x 100 ft. Ekman Holm & Co., Phoenix Building, are architects.

**City Council,** Geneseo, Ill., has been authorized to arrange fund of $150,000 for erection of a municipal electric light and power plant. Warren & Van Pragg, Inc., Decatur, Ill., is consulting engineer.

**Milwaukee Saw Trimmer Corpn.,** 612 East Clybourn Street, Milwaukee, has been incorporated to manufacture saw trimmers and general line of equipment for printing and publishing plants. Principals are Fred W. Billker, 2731 West Fairmount Avenue; Albert A. Meyer and Helen German.

**Denmark Motor Device & Engineering Co.,** Denmark, Wis., has taken three-year lease of abandoned Rooseveit grade school at Two Rivers, Wis., and is making alterations preparatory to transferring equipment. Some additional equipment will be installed. Company specializes in manufacture of carburetors, gasifiers, fuel pumps, etc. J. V. Dearmann is president and chief engineer.

**Fred T. Kern Co.,** 5159 North Lake Drive, Milwaukee, has contracted with Worden-Allen Co., Milwaukee, for manufacture of new type of continuous paving outfits for secondary highways, with crawler type mountings, designed by Arnold Reuss. Product is to be leased to contractors on tonnage basis.

## SOUTHWEST

**Crescent Refining Co.,** Holdenville, Okla., has approved plans for oil refinery on about 20 acre tract, recently acquired. Company has acquired plant of Wewoka Refining Co., Wewoka, Okla., and will remove to Holdenville, with additional equipment for gasoline production. Cost about $85,000 with equipment. H. H. Pegg, Allen, Okla., is company engineer.

**Soltz Machine & Supply Co.,** 520 East Third Street, Pine Bluff, Ark., has been organized by A. H. Soltz and associates, to operate a general machine and repair works.

**City Council,** McCrory, Ark., plans installation of pumping machinery and other equipment for new municipal waterworks. A fund of $125,000 is being arranged.

**H. D. Landers,** Oklahoma City, Okla., is at head of project to erect a new oil refinery near Gladewater, Tex., to cost about $125,000. Steel tank storage and distributing division will be built. Company will be organized to carry out enterprise. W. C. Goforth, Oklahoma City, is interested in project.

**Supervising Architect,** Treasury Department, Washington, asks bids until April 5 for new utilities building for light, heat, power and water service at Southwestern Reformatory, El Reno, Okla.

**Petroleum Refractionating Co.,** Longview, Tex., is resuming operations at oil refinery near city, closed for about 15 months. Improvements will be made, including pipe lines and connections with number of oil wells in Sabine River district.

**Standard Crude Oil Refining Co.,** Texarkana, Tex., recently organized by Julian S. Friede, Texarkana, and associates, is planning early erection of first unit of new oil refinery. Cost about $50,000 with equipment.

**Crescent Foundry Co.,** Johnson Street, Amarillo, Tex., will take bids soon for one-story foundry addition, 60 x 80 ft.

## SOUTH CENTRAL

**Board of City Commissioners,** Birmingham, J. M. Jones, Jr., president, plans installation of electric pumping machinery, tanks and towers, pipe lines and other equipment for proposed industrial water supply system, capacity about 50,000,000 gal. daily. Cost over $2,000,000 with equipment.

**Elliott Mining & Engineering Co.,** Edwardsville, Ala., has authorized installation of new mechanical-washing and sorting plant at gold-mining properties at Aracoochee, near Helfin, Ala. Cost over $25,000 with equipment.

**United States Engineer Office,** Memphis, Tenn., asks bids until March 14 for one two-drum, double cylinder, throttle-reversing steam winch (Circular 485).

**Common Council,** Hickman, Ky., is considering erection of a municipal electric light and power plant. Cost over $70,000 with equipment. Municipal waterworks and system is also planned.

**Ancona Baking Co.,** New Orleans, has plans for one and two-story plant, 125 x 130 ft., with traveling ovens, mixing machinery and other equipment. Cost over $40,000 with machinery. Jones, Roessle & Olschner, Maison Blanche Building, are architects.

## PACIFIC COAST

**Associated Oil Co.,** 79 New Montgomery Street, San Francisco, has let general contract to Dinwiddie Construction Co., Crocker Building, for one-story oil-treating unit to refinery at Avon, Cal.

**Hassayampa Gold Mining Co.,** Kirkland, Ariz., care of A. L. Flagg, P. O. Box 2246, Phoenix, Ariz., consulting engineer, has plans for new cyanide mill at gold mining properties near Kirkland. Cost about $40,000 with equipment.

**City Council,** Paso Robles, Cal., asks bids until April 5 for one full Diesel engine with accessories, and two motor-driven 75-hp. booster pumping units, each 600 gal. capacity, with auxiliary equipment, for municipal waterworks.

**Bureau of Supplies and Accounts,** Navy Department, Washington, asks bids until March 14 for galvanized steel expanded metal (Schedule 9670) for San Diego Navy Yard; until March 21, 5200 boiler tubes (Schedule 9711), 5000 lb. shot copper nickel alloy (Schedule 9710) for Mare Island yard; one roller table, one floating head and one clutch control (Schedule 9608) for Puget Sound yard.

**Southern California Edison Co.,** 601 West Fifth Street, Los Angeles, plans extensions and improvements in transmission lines at Santa Barbara, Cal., and vicinity. Cost about $175,000 with equipment.

**Board of Public Works,** Seattle, will close bids about April 15 for completion of Diablo power plant and transmission line, forming part of municipal Skagit River hydroelectric power development. Cost about $1,620,000. J. D. Ross is superintendent, city lighting department.

**Superintendent of Lighthouses,** Ketchikan, Alaska, asks bids until March 21 for two Diesel engine-driven compressors for Cape Hinchinbrook Light Station, Alaska (Proposal 6100).

**Arrowhead Brewing Co.,** San Bernardino, Cal., care of Rosecrans & Emmie, 515 Black Building, Los Angeles, representatives, has been organized by Richard R. Nelson, San Bernardino, and associates, capital $300,000, to erect a brewing plant. Cost about $150,000 with machinery. A. C. Zimmerman, 824 H. W. Heilman Building, Los Angeles, is architect, in charge. Joseph R. McGuire, Los Angeles, is interested in new company.

**McClintic-Marshall Corpn.** will utilize portion of Alameda, Cal., plant of Bethlehem Shipbuilding Corpn. for assembling fabricated structural steel for Golden Gate bridge at San Francisco.

## FOREIGN

**British Cellaphane Co., Ltd.,** London, England, manufacturer of cellulose transparent wrapping materials, has taken over a former textile mill at St. Helens, Lancashire, and will remodel and equip for new mill. Cost over $350,000.

**South Manchuria Railway Co.,** Mukden, Manchuria, is planning construction of new railroad from Tunhua to point at Korea border, also from Lafa to Harben and from Hailun to Koshan, for connection with Hulon-Hailun Railway, to include car and locomotive repair and equipment shops, coaling stations and other mechanical structures. Cost over $1,000,000 with equipment.

**Dorman Long & Co., Ltd.,** Middlesbrough, England, has plans for new blast furnace at local Cleveland steel works, to have capacity of 400 tons a day.

**Carlos Zorn,** 1086 Casilla de Correo, Buenos Aires, Argentine Republic, is at head of project to operate gold and copper mining properties, and plans purchase of concentration and other mining machinery.

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Lamson & Sessions Co. and subsidiaries, bolt and nut makers, report a net loss in 1932 of $681,340 after interest and depreciation, as compared with a net loss of $519,609 in 1931. Current assets Dec. 31 were $1,057,047, and current liabilities were $697,952.

## *In some things, lack of Uniformity is* FUNNY

# —but lack of *Uniformity* in a WELDING WIRE is SERIOUS

When there is variation in a rod, or between one rod and another, that lack of homogeneity is infused into the *weld*. For after all, the weld is simply the metal in the rod melted, deposited and made integral with parent metal. The weld can be no better than the metal that composes it.

Wilson Wire—rod for rod and bundle for bundle—is *uniform*. Every rod is exactly like every other rod of the same grade (analysis) from the first globule you deposit to the last.

Use *uniform* Wilson Wire and obtain *uniform* welds. Consult Wilson engineers on your welding problems. Wilson Welder & Metals Co. Inc., North Bergen, N. J.

Wilson Welders are pre-eminent in close current control. As proved by volt-ampere curves, they give you correct, constant heat over the full welding range, and enable you to produce strong, fine-grain welds at every range.

## Use WILSON

## WELDING WIRE—*it's Uniform*

# Discusses Objections to Use of Welded Steel Floors

(*Concluded from Page* 388)

fill about 2½ in. thick. This cinder concrete fill is then covered with 1 in. of cement mortar or some other floor covering. In a steel plate floor the same procedure can be used if desired. The principal objection to this, however, is that it adds a great deal of unnecessary dead weight to the floors.

In a battledeck floor the small conduits may be run between the small I-beams and through small holes punched in the webs of these beams near the neutral axis. Larger pipes may be run between the small beams to the girders and then along the webs of the girders just above the lower flanges. Another simple solution is to run all conduits immediately below the small I-beams and then use a suspended ceiling. With a cell-type floor, made by welding flat steel sheets to a lower corrugated sheet, the space between the corrugations and the flat top may provide excellent means for running conduits.

Thus it may be seen that use of steel floors makes the installation of conduits easier and less expensive. When steel floors become more common electricians and plumbers will soon find that their products may be easily installed in a variety of ways. Here again some of the leading building material companies have already studied this problem and have devised practical methods.

*7.*—Although welding is still considered unreliable by many engineers, its opponents are gradually becoming fewer, due to the excellent research that has been conducted by the American Welding Society, the Lincoln Electric Co., General Electric Co., Westinghouse Electric & Mfg. Co., American Bridge Co., and many others. The research report of the structural steel welding committee of the American Bureau of Welding will probably go a long way toward crystallizing opinion on welding. The number of good welders is steadily increasing and welding equipment is being improved so that those who have kept pace with these developments know that welding is to become a factor of increasing importance to the structural steel industry.

### Steel Floors Economical

*8.*—It is practically always true that new construction methods are costly at first because the workmen do not fully understand the work and therefore waste time and make errors. The cost of some of the first battledeck floors was high, partly because the architects and engineers did not anticipate all the problems that were encountered, partly because of the inexperience of the workmen, and partly because too much time and money was spent for the welding. Field welding is expensive and should be reduced to a minimum. Bulletin No. 3a of the A.I.S.C. shows how to compute the amount of welding required to develop the shear between the plates and the I-beams. Further advantage in reducing the amount of weldings is that trouble from warping and buckling of the plates and beams, due to local temperature stresses, will be largely eliminated.

Another reason why steel floors are considered expensive is that most architects and engineers figure the cost of floors on a square foot basis and do not include all the economic factors that should be considered. As soon as they discover that a steel floor costs about 10 cents a square foot more than a typical concrete floor on steel beams, they conclude that steel floors are not economical. It will be shown later, however, that when all the advantages of steel floors are considered that they are more economical both in first cost and also ultimate cost.

It has been shown that some of the objections to steel plate floors are not valid and the others can be greatly reduced by proper study of the factors involved. It is sincerely hoped that the entire steel industry, and more particularly the steel plate manufacturers and welding companies will take the lead in discussing the advantages and disadvantages that arise from the use of steel floors. If architects and engineers can be induced to think about steel floors, it is quite probable that great progress can be made in overcoming the objections and improving the efficiency and economy of steel floors. A few well-directed experiments would probably answer effectively many of the fears that exist.

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# What the Machine Has Done to Us

(*Concluded from Page* 391)

commodity price basis has followed in direction the real wage computed on the cost of living index but has indicated a greater extent of change It would seem, therefore, not illogical to assume that real wages computed on wholesale prices would show an abnormal dislocation at the time of the Civil War price peak but that in general the data charted on this basis would show the direction of the underlying trend. Thus the average annual real earnings of the wage earners in manufacturing industries would appear to have approximately doubled in the forty-one years from 1849 to 1890, an assumption which leads to the conclusion that real wages in 1849 were on a level represented by an index number of 40 on the basis of 1926 = 100 as compared with an index number of 105.2 for 1929 and 101.7 for 1931. Rough as may be this approximation from the standpoint of mathematical science, we have ample substantiation in our non-scientific knowledge of the human values involved.

### Summary

Thus it is apparent that the average annual money wage of the worker in the manufacturing industries has advanced much more rapidly than has the cost of living so that the real wage has progressively advanced throughout the period of mechanization in those industries. The increase in intangible additions to the wage such as leisure time, amelioration of living and working conditions, opportunities for educational and cultural advance, public health service, and so forth, has probably been even greater than the advances that can be reduced to figures.

Mechanization of the manufacturing industry has made available in abundance to the average wage earner thousands of comforts and delights which otherwise would not have been available to anyone at any price.

And, finally, a most abrupt increase in the relative real wages in the manufacturing industry occurred about 1920, which disrupted a long established equilibrium.

There is no mysterious well from which pay roll funds may be drawn. The only source of pay roll funds is the source from which all other items of cost must be drawn. It is the proceeds from the sale of the goods in the manufacture of which the costs are incurred. That source is ultimately the consumer of the goods. The real wage therefore is measured by the balance between the income and the outgo of the wage earner and involves his status as a consumer as well as his status as an earner. A change in that balance in favor of one group can be accomplished only at the expense of other groups. The other groups most affected are generally the wage earners in other industries. The effect is to deprive these others of the products they cannot afford to buy, the resultant effect is a contribution to disemployment in the industry whose real wage has become disproportionately high, through restriction of market.

It seems possible that the wage earners in the manufacturing group might receive a larger total average annual income if they could be given full time employment at reduced hourly rates than they are now receiving on part time employment at present rates per hour. Any attempt to restore the equilibrium of real wages as between occupational groups by raising the cost of living must inevitably work undue hardship on those occupational groups whose earnings have not been raised above the previously existing level of equilibrium.

# How TO FIND THE *ONE* STAINLESS STEEL *THAT BEST MEETS YOUR NEEDS*

All eyes are on stainless.

But many are frankly puzzled by the multiplicity of types and grades and names of stainless steels.

How to select the specific Stainless Steel to meet a specific requirement? That is the puzzle for many a manufacturer eager to modernize his product with this new and versatile material.

Illinois Steel Company manufactures a comprehensive series of Stainless Steels. One of these steels is the one you are seeking. One of them has the physical and metallurgical properties you need. Which one? Our engineers will be glad to consult with you, study your problem, and present conclusive evidence as to the particular grade of USS Stainless Steel which is ideal for your applications.

### *Here's USS 18-8, for instance*

A steel of unusual resistance to corrosion attack, yet one which is also inherently amenable to virtually every mode of working known to the metal workers' art. It may be forged, pierced, rolled, drawn into finest wire, spun, deep drawn, machined, welded, and may be polished to a beautiful lustre which remains untarnished even in moist air.

USS 18-8 is practically non-magnetic and is austenitic, hence highly ductile.

While USS 18-8 is extremely versatile, there are certain applications in which one of the other USS Stainless Steels may better meet your requirements.

There is a USS Stainless Steel to meet every requirement.

| *Ferritic* | *Austenitic* |
|---|---|
| *USS 12 & 12Z* | *USS 18-8* |
| *USS 17* | *USS 18-12* |
| *USS 27* | *USS 25-12* |

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# STAINLESS AND HEAT RESISTING STEELS

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# Does the Tail Wag the Dog?

(*Concluded from Page* 386)

trick. Will a permanent moratorium prove any more effective?

It must be remembered in this connection that the United States is the final creditor. It cannot pass the debt burden on to other nations. Cancellation relieves Europe but shifts the burden to the shoulders of American taxpayers.

It is argued, however, that we would be more than compensated by a revival of foreign demand for our products. This is questionable. We might make a trade with Great Britain whereby she would agree to take a certain quantity of our farm products in consideration for substantial debt reduction. But would that help the position of the farmer materially? The swollen world surplus of agricultural products would still have a depressing effect on prices. In fact, right at this point we run up against the stone wall of agricultural overexpansion. At this juncture, also, we come face to face with the breakdown of the free trade policy which was followed for years by the British and is now recommended for us.

### Free Trade Formula No Longer Works

Great Britain, mother of the industrial revolution, got a head start in manufacturing and for a long period piled up huge profits by exchanging the products of her factories for the produce of agricultural nations. Much of the capital she accumulated was reinvested in these raw material countries, increasing their output and hence their ability to buy British manufactures. This formula, later adopted by other European nations, worked well so long as the growth of industrial nations kept pace with the increase in agricultural yield. However, population growth in the industrial nations has slowed down. Moreover, the war overstimulated agricultural expansion outside of Europe, and the resumption of production in the combatant countries found the world with a large excess of cultivated land. A still further expansion of producing capacity was caused by the post-war capital flow to raw material countries. This was concealed for a time by artificial price control, which however only delayed and aggravated the final breakdown of markets.

The main difficulty with the free trade theory is that it tries to build up a reciprocal relationship between elastic and unelastic products. The demand for manufactured goods is highly elastic. Man's capacity to use factory goods is limited only by his buying power. On the other hand, man's capacity to consume food products is definitely restricted by his appetite and his digestive powers.

The world needs greater consumption, not of food products, but of manufactured products and the raw materials from which they are made. How can consuming power be built up? Certainly not in a free trade system where labor is exposed to competition from the lowest paid wage earners in the world. Capital in a free trade world really defeats its own ends. When British interests, for example, build textile mills in the Orient, where labor can be obtained for a mere pittance, they are weakening the position of textile workers in England. In fact, this very policy has drawn strong protests from such well-known public men as George Bernard Shaw.

But Europe learns this lesson slowly. The United States and Canada are the only countries that have learned how to consume. Labor was scarce in pioneer days on this continent. The dissatisfied wage earner always had the alternative to going on the land. Hence the status of labor was kept on a higher level than prevailed abroad. When, finally, our frontiers had disappeared, American labor succeeded in gaining artificial protection through restriction of immigration.

The preservation of a high standard of living among our masses made mass consumption possible; it stimulated industrial growth as no other factor has in economic history. A few figures will demonstrate what a tremendous consumer the United States has become.

### What American Consumption Means to World Trade

Having only 6.3 per cent of the world's population and occupying 5.8 per cent of the world's land area, this country operates (end of 1930) 74 per cent of the world's motor vehicles, and consumes (1929, in terms of quantity) 61.3 per cent of the world's output of petroleum, 62.3 per cent of the world's production of rubber, 45 per cent of the world's steel, 38 per cent of the iron ore, 64 per cent of the asbestos, 48 per cent of the tin, 42 per cent of the copper, 37 per cent of the zinc, 36 per cent of the lead, 73 per cent of the silk, 27 per cent of the coffee, 21 per cent of the sugar, and 17 per cent of the wool, to cite a few examples.

In 1929 the United States led the world as a trading nation, doing nearly 14 per cent of total international business. In that same year it imported 16½ per cent of all the goods exported by the remaining countries of the world.

Other nations need our trade much worse than we need theirs. The restoration of our great consuming power would mean far more to world recovery than debt cancellation or reciprocal tariff agreements. Any tariff trade that would expose us more than at present to the low prices of competitive factory products would be more hurtful than helpful. It would be like removing immigration restrictions. Cheap foreign labor, which is now shut out of the country by limited quotas, would, in effect, be allowed to enter, although physically remaining abroad.

### Does Tariff Protect Labor?

It is true that theorists scoff at the idea that a tariff protects labor. They contend that consumption depends on production and that, if production is large and at low cost, consumption will be high. That might be true if living standards were relatively uniform throughout the world, but so long as there is cheap labor to exploit, it will be exploited, and the production from that labor, instead of increasing consumption, will build up unwieldy world surpluses to depress markets, close factories and rob higher priced labor of employment. Pending an upward leveling of living standards throughout the world, it is best as a national policy to cling to a principle that made the United States the only large country that ever enjoyed mass prosperity.

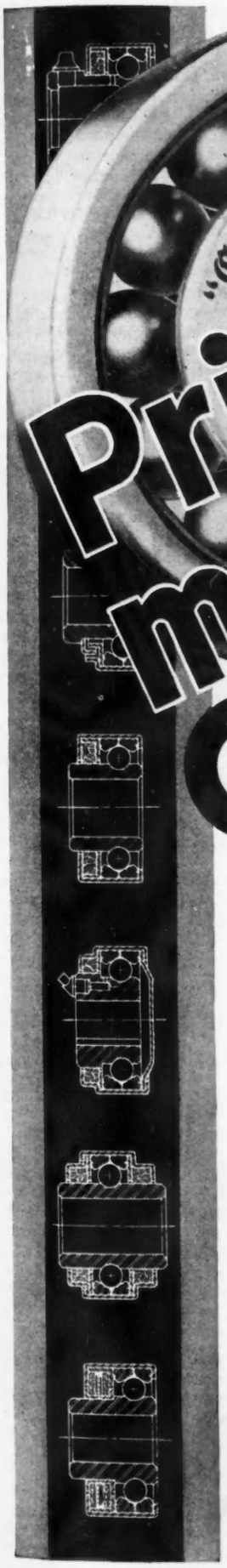
This country cannot be pulled out of the depression by purchasing a market for our cotton growers and wheat farmers at the expense of industry. It would be far better to subsidize those groups and at the same time take steps to make a revival of industrial activity possible.

### Depreciated Foreign Currencies Nullify Tariff

The chief obstacle to an industrial revival is the pressure of foreign depreciated currencies on our prices. Our whole price structure is pulled down by this influence, which really constitutes a nullification of our tariff. The passage of legislation providing for the addition of duties equal to the amount of currency depreciation is our greatest need. It would halt the fall in domestic prices and would tend to release business now held back in anticipation of further declines. Greater volume would again make profits possible, and profits would stimulate enterprise, expand employment and general buying power.

Instead of following this sane course, we are permitting the full force of world disorder to wreck our prices, paralyze our industry, increase our unemployment and aggravate our debt burden. Foreclosures, defaults, local and State moratoria, farm rebellions, are all symptoms of a condition that may degenerate into nation-wide insolvency.

In our present weakened state we haven't the economic power to consume more imported products. Foreign pig iron producers have captured the merchant market on our Atlantic

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seaboard, but no one has noticed a consequent gain in foundry activity. The whole conception that we can improve our situation by leaving the door wide open to cheap foreign manufactures is fallacious. One wonders what the cotton growers would say if told that their status would be bettered if this country greatly increased its imports of cotton. But the low tariff advocates do not envision an increase in our imports of raw materials. What they really have in mind is a marked expansion in our imports of manufactures. They studiously refrain from mentioning that greater consumption of foreign factory products would mean smaller consumption of foreign raw materials. Yet this would be the inevitable result.

Our position as the world's largest consumer of raw materials was achieved by building up manufacturing capacity to utilize those materials. That factory capacity in turn was dependent for a market on large mass purchasing power. Destruction of that buying power is not the road to world trade recovery.

### How Dependent Are We on Foreign Markets?

The question really gets down to whether the tail wags the dog or the dog wags the tail. Europe and our own internationalists contend that the tail wags the dog. We must increase our imports (they actually mean our imports of European manufactures) so that we can increase our exports, we are told. Yet even at the high tide of prosperity in 1929 our exports were equal to less than 10 per cent of our total production.

The internationalists counter that this is not a fair representation—that it is an average and does not disclose the dependence of certain important individual products on exports. It is pointed out that half of our cotton, 40 per cent of our tobacco, 15 per cent of our wheat, 33 per cent of our lard, 36 per cent of our copper and 35 per cent of our kerosene are exported, to cite a few examples.

### Offsetting Imports of Raw Materials

But if imports are necessary to balance our exports, why isn't it disclosed that our imports of both crude materials and foods exceed our exports of those products? When considering our exports of cotton, why not take into account our huge imports of silk and wool? The United States consumes 35 per cent more silk than all other countries combined. Certainly a flood of imports of cheap manufactured products which would close more of our factories and throw more workmen into idleness would have a disastrous effect on our consumption of silk and wool. Our industrial population is far more numerous than the agricultural population in the cotton belt.

In considering our tobacco exports, why not take into account the counterbalancing influence of our large coffee and sugar imports? Why not also deduct our tobacco imports, which are equal, in value, to one-third of our exports?

In considering copper exports, why not take into account the offsetting influence of heavy tin imports? But even if we don't do that, there are other factors to keep in mind. The copper export figures are deceptive, as are others. Our copper exports are really largely offset by our imports of copper and copper ore. Our domestic consumption of copper is nearly 90 per cent of our production of copper from domestic ore.

A similar situation prevails with respect to petroleum. While our exports are large, so are our imports. Taking this into account, we find that we consume 90 per cent of the production of our own wells. If imports are essential to offset exports, we have them to a large extent in the petroleum and copper industries.

### Are There Large Concealed Exports of Steel?

Low tariff advocates make a point of the fact that the apparently small exports of certain commodities are actually much larger than they seem. For example, the exports of finished steel from 1922 to 1931 averaged only 5.7 per cent of our production, but if account were taken of the steel that went into automobiles, machinery, tin cans and other products exported in manufactured form the proportion would be about 12½ per cent, it is estimated.

This analysis is faulty for several reasons. It makes no deduction of steel imports. It makes no allowance for imports of raw materials by the iron and steel industry. For instance, the steel industry's imports of manganese ore, a high-priced material, account for 21 per cent of the world's total output (1929 figures). No mention is made of the fact that we import more ordinary iron ore than we export, the excess in 1929 having been 1,834,917 tons. Nothing is said of the steel industry's tin imports, which amount to 15 per cent of total world tin output. And it is well that the automobile industry was specifically referred to. In this case, exports of steel in finished form are offset by imports of other required materials, such as rubber, asbestos, nickel, wool, etc. Largely because of our automobile industry this country consumes 62 per cent of the world production of rubber.

As to machinery, which in 1931 accounted for 13.4 per cent of our total exports in value, standing second to cotton (13.7 per cent), it is of such diverse character that it is impossible to indicate the number or quantity of imported materials used in its manufacture. However, our exports of machinery amount to only about 9 per cent (8.6 per cent in 1929) of our production. Similarly, our exports of all manufactured and semi-manufactured products represent less than 9 per cent of our output (1929 statistics).

It is significant that our excess of exports has been entirely in finished manufactures. In foodstuffs, crude materials and semi-manufactures we import more than we send abroad. Yet our industrial production has fallen much more than the percentage of our output represented by exports of factory products. If we could recover merely the domestic business in manufactures that we had in 1930, we would have good times. Instead, we have linked our mass production, high consuming economy with the pinch-penny, penurious, exploiting economy of the rest of the world. Instead of preserving and cultivating domestic consumption, we pin our hopes on reforming the world at large and bringing it up to our standards.

Such a policy is ill-advised and dangerous. East is East and West is West. Similarly, America is America and the Old World is the Old World. The way to help the world is to import more non-competitive raw materials rather than more competitive manufactured products. But we can do this only if we preserve the earning power of the factories and wage earners that convert the raw materials. Bernard Baruch sized up the situation very well when he said:

"For the past ten years we staged a fantastic boom on the basis of an increased export financed entirely by unwise foreign loans. The present argument for increasing export by relieving burdens on debtors at the expense of American labor is a repetition of the same blind folly in a different guise. It would be far better to cultivate our domestic market by increasing the buying power of our people."

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## Lapping Improves Tap Performance

Taps, tapping machines and tap sharpening were discussed by Herman Goldberg, chief engineer and superintendent, R. G. Haskins Co., Chicago, at a meeting of the American machinery and Tools Institute, held at the Lewis Institute, Chicago, Feb. 22. "Trick" as well as practical applications were demonstrated, using standard Haskins equipment. Tapping speeds up to 4000 r.p.m. "in" and 8000 r.p.m. "out" were shown to give satisfactory results in Classes 1, 2 and 3, and even Class 4 fits.

The marked improvement in taps resulting from polishing the flutes and cutting edges with special lapping wheels was emphasized, this operation eliminating the tendency of the tap to load and prolonging the life of the cutting edges. It was shown that with the adoption of high-speed tapping more thought has to be given the tap and equipment for the correct sharpening and lapping of taps.